ARCHIVES OF

Physical Medicine and Rehabilitation

MARCH 1960
Volume 41, No. 3

3rd International Congress of Physical Medicine

IIIe Congres international de Medecine Physique

3° Congreso internacional de Medicina Fisica

3. internationaler Kongress für Physikalische Medizin

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AMERICAN ACADEMY OF PHYSICAL MEDICINE AND REHABILITATION
30 N. Michigan Avenue, Chicago 2, Illinois

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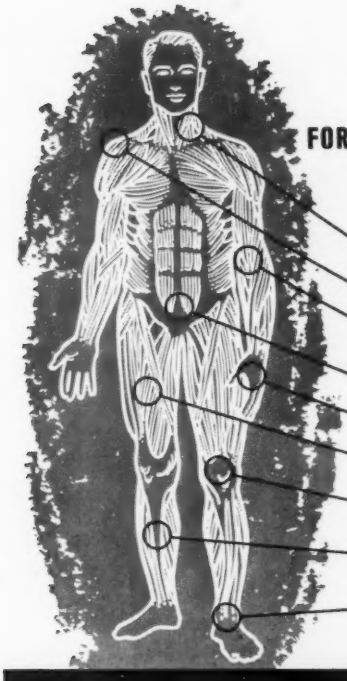

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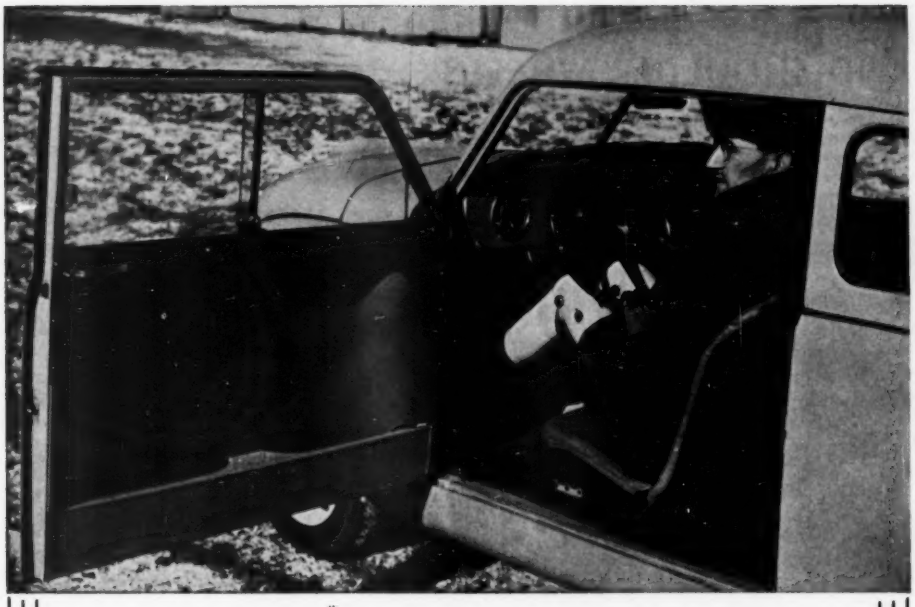

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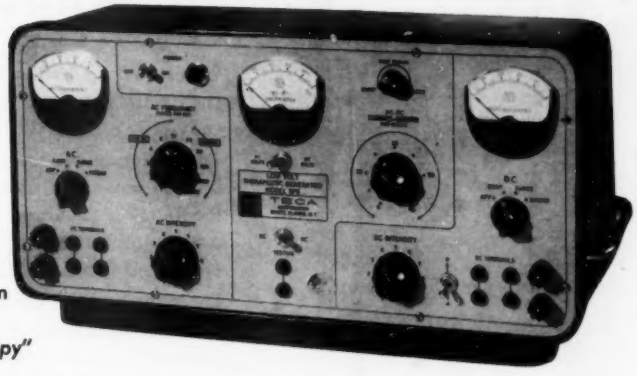

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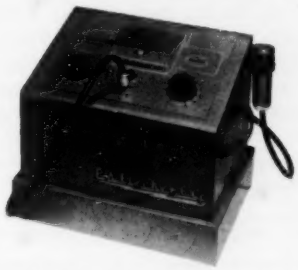

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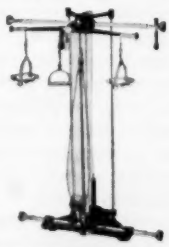

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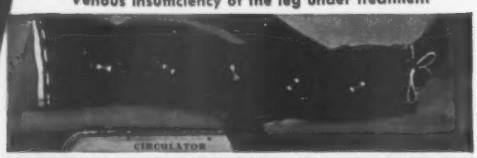

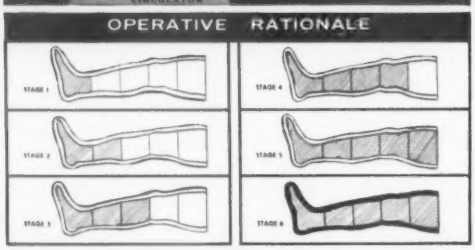

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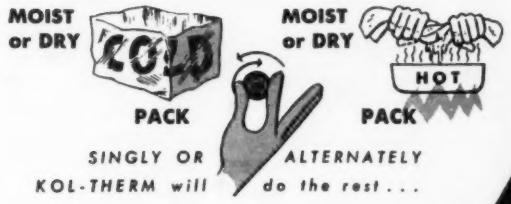

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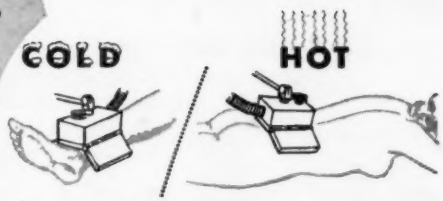

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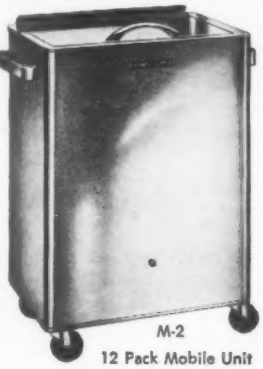

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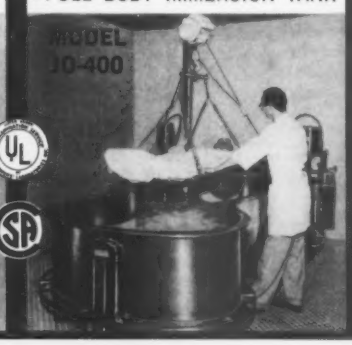

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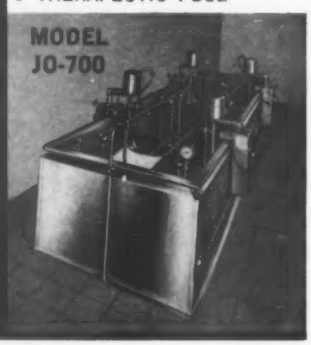

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1. This competition is open to all persons except Members of the Boards of Governors of the American Congress of Physical Medicine and Rehabilitation, American Academy of Physical Medicine and Rehabilitation and the Program Committee of the 3rd International Congress of Physical Medicine.

2. Manuscripts must be in the office of the American Congress of Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2, Ill., not later than May 2, 1960. This deadline will be rigidly maintained.

3. The essay must not have been published previously.

4. Essays will be judged on original work, contribution to knowledge of this subject and clear exposition of the facts. Contributions should not exceed 6000 words (exclusive of headings, references, legends for illustrations, tables, etc.) and the number of words should be stated on the title page. Seven copies of the manuscript must be submitted — two original copies and five carbon copies. *No papers will be returned.*

5. The winning contribution will be determined by the Program Committee of the 3rd International Congress of Physical Medicine.

6. All contributions will become the property of the American Congress of Physical Medicine and Rehabilitation and will be released to the ARCHIVES OF PHYSICAL MEDICINE AND REHABILITATION for publication as determined by its Editorial Board.

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The Ninth John Stanley Coulter Memorial Lecture: Tomorrow's Physiatrist

Robert L. Bennett, M.D.
Warm Springs, Ga.

● Because of the very nature of the diseases he cares for, tomorrow's physiatrist will be thoroughly oriented in the concept of total rehabilitation. However, he will not think of himself as specializing in "total rehabilitation," but in the over-all care of a well-defined group of diseases that primarily affect the neuromuscular and musculoskeletal systems. For adequate care of many of his patients with these diseases, he will need the advice and skill of other medical and surgical specialists. For his patients who need more than definitive medical and surgical care, he will utilize the skills of many paramedical disciplines. He will have the ability to interpret, correlate, and utilize test data from these disciplines much as any physician or surgeon, regardless of specialty, now utilizes data received from the x-ray department or the clinical laboratory. In essence, the physiatrist of tomorrow will be a physician with specialized interest and training capable of anticipating, recognizing, and handling the problems inherent in the care of those diseases with which the field of physical medicine and rehabilitation is most concerned.

In 1952 I was given the opportunity of addressing the American Congress of Physical Medicine and Rehabilitation on the subject of "The Training of the Physiatrist."[1] At that time I tried to indicate, in rather broad terms, the training needed by our young physicians to take advantage of certain opportunities for professional advancement that were open to the specialist in physical medicine and rehabilitation. I also said that while the problems faced by our specialty in gaining further recognition and status were many, they could all be solved by "knowing where we were going, and training men to get us there." This implied that I knew where we were going. Actually, I was in some doubt. I would not admit my former doubts if I did not honestly feel that, while we have not taken advantage of all of our opportunities, our specialty is developing in purpose and direction to the extent that I now think I know "where we are going." I therefore welcome this opportunity to bring my thoughts up to date and, in so doing, visualize the physiatrist of tomorrow. I am well aware of the possibility that my concept of the future specialist, and even of the present specialist, in physical medicine and rehabilitation might be quite different from yours. If so, I hope that you will accept the fact that I am speaking sincerely on a subject that has deeply interested me during all of my professional life.

While purpose and direction are important to the success of any endeavor, the will and the opportunity to succeed are even more important. But no one of these, nor any combination, is enough without the ability to see beyond the confines of personal interests and specific endeavor in order to maintain the perspective necessary for continued and worthwhile development. It is only in this way that purpose and direction can be brought into proper focus with desire and opportunity.

Yesterday's Physiatrist

The young physiatrist entering practice today has a far greater desire and opportunity for utilizing his total medical knowledge in the development of his specialty than I did when I started in this field. At that time, twenty years ago, through the influence of such men as Dr. John Stanley Coulter, the physicians interested in physical medicine were devoting much of their time to evaluating the effects of physical agents in the diagnosis and care of practically every ill that plagued mankind. Their efforts led to the establishment of a sound physiologic basis for the use of the keystones of physical medicine: heat, massage, and exercise. The knowledge gained through such evaluation led to the development of new and more effective ways of applying these physical agents. Much of the rest of the efforts of these serious and devoted men was spent convincing their medical colleagues that the devices and technics of physical medicine were a valuable and necessary part of all medical practice. As a natural consequence, most physicians who limited their practice to physical medicine at that time had little desire to develop a patient practice of their own. Even if

Read at the Thirty-seventh Annual Session of the American Congress of Physical Medicine and Rehabilitation, Minneapolis, September 2, 1959.

Executive Director, Georgia Warm Springs Foundation.

they had so desired, their opportunity for doing so was limited because they became identified more by their tools than by the diseases they treated. They were, therefore, called upon to use these tools to care for specific problems arising in patients whose over-all care was directed by other physicians. Unlike most other medical and surgical specialists whose practice requires personal diagnostic as well as therapeutic skill, these specialists in physical medicine were rarely called upon to make a diagnosis. Even requests for their therapeutic knowledge were certainly not frequent.

In the larger hospitals and clinics, the physician interested in physical medicine sought after and was given the responsibility of developing a department of physical medicine. In such a department he had the opportunity of seeing many different kinds of diseases, he could observe the response of these diseases to the application of physical agents, but, in most instances, his personal therapeutic skill was not in great demand. By this time, the technical fields of physical and occupational therapy had been established, and schools were training these therapists to work under the prescription of the medical doctor. The departments of physical medicine employed many of these therapists, and the physicians in charge of the departments were given the responsibility of directing their work. However, this did not necessarily mean that the specialist in physical medicine, even though he was a director of such a department, was called upon to use his personal therapeutic skill. Commonly, the physical treatment was suggested or even specifically prescribed by the patient's own physician who utilized the physical medicine department much as he used the x-ray department or the clinical laboratory. The specialist in physical medicine was frequently considered an unnecessary delay between the referring doctor and the therapist.

The private practice of physical medicine did exist at that time, and many outstanding men contributed to the practice of medicine and to the specialty of physical medicine by their success in private practice. However, most men, particularly the new men going into the specialty, were employed part time or full time directing departments of physical medicine in hospitals, clinics, and medical schools. While this pattern of specialization in physical medicine still exists, and will continue to exist as long as the therapeutic use of physical agents remains under medical supervision, it cannot now satisfy all of the demands of the modern physiatrist and can be but a small part of the pattern of his future.

Medical Advances and Rehabilitation

All of us are well aware of the truly fantastic advances in diagnostic, preventive, and therapeutic medicine over the past twenty years. These advances have had a profound effect on all phases of medical practice. They have increased the importance of many specialties, decreased the importance of a few, but in all they have demanded changes of emphasis within the structure of each specialty by both solving old problems and discovering new ones. In its own way, the specialty of physical medicine contributed to these advances and, in so doing, altered the structure of its specialty. As we developed a better understanding of the physiologic effect and therefore the therapeutic usefulness of the physical agents, we found that we were using fewer complicated forms of heat and exercise, and were putting far greater emphasis on basic therapeutic exercise and on specific functional training of patients with irreversible physical disability. We were becoming increasingly interested in the pathogenesis of physical disability, and in the prevention of physical disability. These interests led us directly into the field of rehabilitation that was soon to become so important to our specialty and to the entire field of medicine.

If the advances in diagnostic, preventive, and therapeutic medicine, while solving many problems, also created new ones, it was the creation of these new problems that was responsible for the sudden growth of that part of medical practice that we now call "rehabilitation." Concern for the full realization of potentialities, which is the basic purpose

of rehabilitation, is deeply rooted in our medical heritage. Medicine has always taken pride in the fact that it has considered the individual more important than his disease. However, our ability to assist the chronically disabled to any significant degree lagged far behind our desire to do so. The scientific processes of rehabilitation were almost completely lacking in the field of medicine until very recent years. I think it can be safely stated that our present era of rehabilitation, which now is providing the practical fulfillment to the age-old desires, began when the field of medicine learned to save the lives of patients with conditions formerly beyond the control of even the most skilled physician and surgeon. The discovery of aseptic technics, safe anesthesia, diagnostic and therapeutic x-rays, antibiotics, and fluid and electrolyte replacement technics all combined to permit control of disease, injury, malignancy, congenital faults, and even the processes of age with a degree of success hardly dreamed of twenty years ago.

Despite the truly amazing improvements in preventive and corrective medicine and surgery, the effects of developmental faults, trauma, aging, and of many diseases are not always completely reversible. Many of these leave scars that alter the capacity to live acceptably with the fortunate normal, or even to be self-dependent in meeting the simple demands of everyday living. Fantastic as it may sound, our increasing ability to save and prolong life has created a demand for a type of after-care never before needed, after-care that is far different than that usually required by the average patient with his average medical, social, and vocational problems. World War II, and the extensive epidemics of poliomyelitis during that period and later, are examples of disasters that created problems of after-care which demanded the development of scientific processes of rehabilitation.

The Rehabilitation Center

I don't know when the word "rehabilitation" was put into a medical dictionary. It certainly is not a new word in medicine, but prior to World War II it was used most frequently as the shortened form of "vocational rehabilitation" to describe the efforts to restore the chronic physically handicapped to a remunerative occupation. During this war its meaning was expanded to include the combined efforts of many skills, including those of the physician and surgeon, to achieve for the handicapped full physical, mental, social, vocational, as well as economic usefulness. It was soon realized that such an endeavor required the integrated efforts of at least five different fields: medicine, psychology, social service, education, and, finally, job placement. Development of rehabilitation centers was the next logical step. Rehabilitation centers were in existence long before this period, but they were organized and directed along the lines of the vocational trade school or the curative workshop.

For the most part, the rehabilitation centers that were first developed in our present era were designed and utilized primarily for patients with handicaps, usually of a physical nature, that could not be further improved by definitive medical and surgical care, and for those patients who could not become self-dependent through their own resources because of their handicap.

To further clarify this statement, we must define definitive medical or surgical care as that which rightfully focuses its attention on the disease entity and is concerned with the patient as an individual only as this influences his recovery from the disease itself. In a great majority of problems faced by the physician and surgeon, this is all that is necessary. Rehabilitation would then focus its attention only on the individual whose future is modified by disability over which definitive care has no further control. The rehabilitation center, as it was originally visualized, would attempt through its multiple disciplines to intelligently adapt the disabled individual to a more normal environment or to modify the individual's environment in a way that it complemented rather than imposed on a normal community. A physician interested, trained, and experienced in all phases of chronic handicap

was needed to direct the over-all program for the simple reason that this center would be primarily concerned with severely handicapped individuals whose mental or physical condition might deteriorate under the stresses imposed on them in the attempt to recover satisfactory functional capacity. It was obvious that only the physician could be expected to know the natural history of the disease entities with which the center dealt and to envision the effect on the patients of the stresses of increasing activity and aging.

It was also perfectly logical for many physiatrists to become interested in rehabilitation and in the development of rehabilitation centers. From then on, physical medicine and rehabilitation grew up together, each contributing to the advancement of the other. The pattern of the expanded specialty of physical medicine and rehabilitation became far more interesting and dynamic. But rehabilitation did not confine itself to the care of chronic physical disability. Its technics and its facilities were soon extended to the convalescent care of conditions capable of causing severe and chronic disability so that the degree of disability might be minimized and the long period of convalescence utilized to the patient's greatest advantage. This change took place for the very simple reason that physicians learned to recognize those conditions most likely to result in severe handicap, and experience with the end results of these conditions led to an appreciation of the possibilities of preventing or minimizing certain aspects of chronic disability by specific convalescent care. They recognized that the by-products of disuse and inactivity in diseases requiring long convalescence could be just as chronically disabling as the disease entity itself, but could be prevented or minimized by proper care during convalescence. They soon realized that all the disciplines needed to adequately care for the end results of physical disability could be of greater value if they were initiated during the period of convalescence.

At this point, the whole field of rehabilitation underwent a sudden and dramatic change. If a rehabilitation center could also become a convalescent center, then it certainly must be true that a convalescent center could become a rehabilitation center. In the minds of many, rehabilitation became synonymous with convalescence and even synonymous with recovery. Nurses carrying out basic orthopedic principles of care became rehabilitation nurses, therapists teaching the activities of daily living to their patients became rehabilitation therapists; even physicians and surgeons, practicing well within the confines of their specialties, thought of themselves as majoring in rehabilitation. Rehabilitation became a very popular word indeed, and at times it is difficult to know where definitive care ends and where rehabilitation begins. We are still in this phase of confusion.

Now the physiatrist finds himself again in much the same position as he had been before the rehabilitation era. In many, perhaps most, rehabilitation centers the physiatrist has been given both administrative and medical responsibilities. This phase of his practice is important, it is interesting, it offers reasonable financial remuneration, and it will doubtless play a large role in the development of tomorrow's physiatrist. Despite this, I cannot visualize our specialty prospering or even surviving at this level any more than it could have prospered and survived at the level of physical medicine practice as previously discussed. That this is so must be evident to all of us if we recognize that the concept of rehabilitation is rapidly being accepted as an essential part of the philosophy of all medical practice. The technics and devices of rehabilitation medicine are also rapidly developing to a high degree, and trained personnel are available even though not in numbers sufficient to fill all of the needs. Perhaps most important of all, the physician or surgeon who has the responsibility for the patient's over-all care has become interested in and is being taught to write the prescription for total rehabilitation.

"Third Phase" of Physical Medicine

Fortunately, the specialty of physical medicine is well started on what might

be thought of as its third phase of development. This third phase is based on two essential changes in what is now called the practice of physical medicine and rehabilitation. These changes may be simply stated. First, the physiatrist is reclaiming his rights and responsibilities as a physician. He is now desirous, and is rapidly developing the capability, of handling all the usual medical problems inherent in those conditions that he treats, and is not limiting his medical practice to the prescription of physical agents and the supervision of technical specialties. Second, the physiatrist is finally being accepted by his medical colleagues as a specialist in those diseases that commonly result in physical disability and can be modified by the tools of physical medicine and the proper utilization of the paramedical disciplines.

What little recognition he has gained in this third phase has been hard won. Further recognition will be even harder because it will come only with his developing competency through extensive training and experience in the total care of these diseases. This we must accept as the real challenge to our residency programs today. It would be much easier for all of us to remain the so-called experts in the use of those physical agents assigned to our field, and to continue to supervise the use of these tools so that other doctors' patients are assured of receiving adequate care in the physical medicine departments or in the rehabilitation centers. As such, we may be a threat to certain paramedical groups, but certainly we would not be looking to our own future as physicians, nor to the future of our specialty.

Today's Physiatrist

Many physiatrists have rebelled at past and present limitations of their practice. This is particularly true of the young, well-trained men who, because they are well trained, want to claim the right to treat patients of their own in the manner that their training, interest, and experience tell them is needed for optimum recovery. We have attracted many such men into our field. They have no desire to be specialists only in electronic apparatus or only in the administration of physical medicine departments or rehabilitation centers. Primarily, they are physicians. As physicians, they have a particular interest in the care of patients with those physical disabilities that can be best cared for through the tools and technics of physical medicine and the proper utilization of paramedical disciplines. I feel that much of the insecurity that I hear voiced by the physiatrist (both young and old) is due to his realization that he has not been adequately trained to handle the specific diseases that he treats most; or he may feel that he is capable but is denied the opportunity of such responsibility in his own practice. To some degree, he resents that he must depend on the direction of other specialists for the care of all but that component of the patient's illness that might respond to his prescription of physical medicine. He is frequently frustrated in his role of acting as the collector of information gained through the skills of other medical and paramedical disciplines without being able to contribute personally by any unique and hard-won skill. He is disturbed by the fact that many clinical and teaching programs in "rehabilitation" are directed by specialists in preventive medicine, pediatrics, orthopedics, neurology, or public health, with little or no training in his specialty of physical medicine and rehabilitation.

Tomorrow's Physiatrist

All of these reactions are healthy because they will eventually result in the development of a well-rounded and dynamic specialty of physical medicine in which men of the highest caliber will further explore and utilize the potentials of physical and rehabilitation medicine through their primary interest and training in diseases that affect motor ability. These physiatrists will be particularly interested in such conditions as the primary diseases of muscle, diseases of both sensory and motor pathways as they affect motor ability, and the diseases of the musculoskeletal system. Because of the demands of these diseases, these men will continue their particular interests in

kinesiology, and in the tools, methods, and devices of physical medicine required to prevent physical limitation through control of disease as well as to restore practical physical activity despite irreversible disease.

Because of the very nature of the diseases that he cares for, tomorrow's physiatrist will be thoroughly oriented in the concept of total rehabilitation. However, he will not think of himself as specializing in "total rehabilitation," but in the over-all care of a well-defined group of diseases that primarily affect the neuromuscular and musculoskeletal systems. For adequate care of many of his patients with these diseases, he will need the advice and skill of other medical and surgical specialists. For his patients who need more than definitive medical and surgical care, he will utilize the skills of many paramedical disciplines. He will have the ability to interpret, correlate, and utilize test data from these disciplines much as any physician or surgeon, regardless of specialty, now utilizes data received from the x-ray department or the clinical laboratory. In essence, the physiatrist of tomorrow will be a physician with specialized interest and training capable of anticipating, recognizing, and handling the problems inherent in the care of those diseases with which the field of physical medicine is most concerned.

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Information relative to securing reprints of this study may be had by checking the Reader Service column on page iv of this issue.

"You must give some time to your fellow man. Even if it's a little thing, do something for those who have need of help, something for which you get no pay but the privilege of doing it."

◇ ALBERT SCHWEITZER

Psychological Aspects of the Development of Speech and Language

Ernest Henrikson, Ph.D.
Minneapolis

● The development of human speech and language depends on a complex interaction between the individual and his environment. Basic to this development is an adequately functioning organism, variations in which can lead to delayed or deviant development. Psychological factors play an important part in determining how influential such variations will be. The general ability level of a person in such areas as intelligence affects his speech and language. Motivation is important for without it, inherent speech and language potentials may not be realized. The general adjustment pattern of the child is very influential. Speech and language represent significant facets of a child's self realization and of his relationship pattern to his social environment and are related to his total development in these areas. The results of psychological trauma on speech and language development emphasize the importance of psychological factors. Psychological influence is evident in all phases of language development ranging from effects on specific sound production through effects on the total language pattern.

A consideration of the psychological aspects of the development of speech and language may quite properly begin with the recognition of the fact that the two terms, "speech" and "language," are not conterminous. "Language" is generally assumed to be the more inclusive term and may be defined as including any form of intercommunicative behavior. "Speech," on the other hand, is included in the definition of language. Speech is the audible aspect of language, that which we hear ourselves say, that which others hear us say, and that which we hear others say.

One problem that becomes apparent immediately in considering the psychological aspects of the development of speech and language is that the psychological cannot be neatly dissected out from the "nonpsychological" as a surgeon might dissect out the cartilages of the larynx. Speech and language development involve a complex interaction between a functioning organism and its environment. There is a constant interplay between various parts of the organism and between the whole organism and the environment. Exactly how these various factors may relate to one another may be somewhat difficult to determine at times. The child who is born with a cleft palate is a case in point. Although there is some relationship between the type of speech such a child will produce and the type and extent of the cleft, there is not, at least according to some investigators, a complete one-to-one relationship. Other factors, such as the intelligence of the child, may have a marked influence.[1]

Development of Speech and Language

Just when psychological factors may enter into speech and language development depends on one's point of view about when speech and language begin to develop. According to one point of view, the early activities of the child, involving primarily crying and beginning with the birth cry, are prelinguistic activities but are bases on which language is built. According to another point of view, beginnings of language are related to the babbling period which follows early crying. During babbling, there is a modification of the outgoing breath stream at the larynx into sound patterns which are later modulated and refined and which, according to this point of view, form the bases of sound production. If one assumes that early crying represents a part of the pattern of the development of speech and language, one is again confronted with different interpretations. According to such writers as Preyer,[2] "The first cry is purely reflexive, like the croaking of a decapitated frog when the skin of his back is stroked. The cry is not heard by the newly-born himself and has not the least value as language. It is on the par with the squeaking of a pig just born, the bleating of a new born lamb and the peeping of a chicken that is just breaking through its shell." Even granting that it may be very difficult for us to know what the squeaking, the bleating, or the peep-

Read at the Twenty-first Assembly of the American Academy of Physical Medicine and Rehabilitation (Seminar on "Rehabilitation in Speech and Language"), Minneapolis, September 1, 1959.

Professor of Speech and Director of the Speech and Hearing Clinic, University of Minnesota.

ing mean to the pig, the lamb, or the chick, it seems fair to assume that such an interpretation would not include much of the psychological. On the other hand, such authors as Blanton[3] feel that the birth cry is "an expression of its (the child's) overwhelming sense of inferiority on thus suddenly becoming confronted by a reality, without ever having had to deal with its problems."

Some of these differences in point of view about the child crying seem to relate to an interpretation of what speech and language are. If one places the stress on sounds as such, one may assume one point of view. On the other hand, if one recognizes that the sounds and symbols involved in speech and language are part of and manifestations of a total communication process, then the interpretation may be different. The child seems to use crying as a form of communication and his crying does, in fact, represent his early vocal relating to his environment. Some psychological factors related to crying have been clearly demonstrated in the studies of Aldrich[4] at the Mayo Clinic. New babies in the nursery at Mayo's seemed to cry more than babies who were released to go home. Various types of cries, including those indicating discomfort, hunger, and "distress" seemed evident. These babies seemed more secure when they heard voices in conversation, felt the touch of a blanket, and recognized that a person answered when their cry was just a "distress" signal and not a sign of physical needs. By using extra nurses who introduced more vocalization into the child's environment, answered the child's "distress" signals and so on, the amount of crying was reduced, on the average, from somewhat over 113 minutes a day to 55 minutes.

Myklebust[5] presents one framework for the consideration of psychological factors in relation to speech and language development. He indicates that three basic psychological processes must be intact if the child is to develop language. These are *identification,* which involves the child's feeling that he wants to be like the talking human being; *internalization,* which is the process of relating symbol and experience; and *assimilation,* which develops as there is a greater need to share experience and as the ability for abstraction and generalization increases.

"Mothering"

The influence of what may be broadly termed "mothering," which certainly includes many psychological factors, on the child's speech and language development and, more basically perhaps, on his total development, has been observed in studies by a number of persons. Pease[6] summarizes some findings from these studies and from particular research done at Iowa State College in saying, "that there is some significant relationship between the development of the infant and the nature of the early mothering experiences would not appear to be open to serious question." After her study of 600 infants in three different maternity hospitals in New York City, Ribble[7] concludes that " 'mothering' a new-born baby helps him to breathe by bringing into action certain nervous reflexes which insure proper and necessary respiration. . . . Good breathing determines smooth speech development and is, throughout life, closely related to both physical and mental health." McCarthy[8] stresses the same point in saying, "If the ministrations to the child are given by a smiling and affectionate mother or mother substitute who has good relationships with her child, he develops linguistically more normally than when the physical care is given him impersonally as a duty by a disinterested person." Studies have shown that young children separated from their family and raised in institutions are seriously retarded in all aspects of their development. Mothering care from attendants or others improves their motor development but their language development shows the least improvement and tends to show more or less permanent impairment.[9-11] Severely neglected children and those whose attachments to adults are interrupted and infrequent are slow in learning to speak and they remain retarded in speech throughout their lives.[12] Orphanage children at the preschool level are retarded in vocabulary and in other aspects of their language development.

An interesting illustration of the influence of the mother on her children is evidenced in the difference between only children brought up in their own home and multiple-birth children.[13-15] Only children, particularly only girls, are the most accelerated in language development and seem rarely to appear in clinics which offer help to those who have problems in speech and reading. Multiple-birth children, such as twins, triplets, and the famous Dionne quintuplets, who must always share their mother from earliest infancy, show retardation in language development. The degree of such retardation seems to vary directly with the number of the same age children involved.

Environment in General

Not only the mother herself but the whole home pattern has a significant impact on the child's speech and language development. Homes set varying standards for the children in them, standards which no doubt frequently reflect broader patterns of emotions and adjustments in the parents themselves. Van Riper[16] gives a vivid illustration of this in saying that in one home, a child's reaching for a glass of water may be accepted; in another, a response may be given to the child saying "wa wa"; a third may require the word "water"; and yet another may insist on such an advanced level of language expression as "may I have a drink?" These emotionally influenced standards can quite obviously have a great influence on the level of achievement which is set for a child, the verbal stimulation which he receives from his environment, and the success or failure which he achieves in attempting verbalization. Van Riper feels that, barring organic deficiency, the language of a child is the product of his immediate environment and that the members of his home and his companions set the tone for the caliber of speech that is "natural" for the child. McCarthy[17] believes that "It is also becoming evident that the emotional climate prevailing in the home provides experiences which have important influence not only on the child's personality adjustment, but also on his language development. . . . The home atmosphere as determined by the personality of the parents seems to be the most important single factor influencing the child's acquisition of language." Pease[6] contends that, as the child develops, his growth in language continues to be, in large measure, a response to the kind of interpersonal climate around him. Freedom and spontaneity in talk are more likely to exist if he meets with flexibility and encouragement in his early experimenting and exploring, and unevenness and distortion are more likely to appear if he encounters rejection or exacting pressures from people significant to him. Specific speech or language variations seem to have significant relationships to emotional factors in the home. The overprotected child tends to stay at the level of infantile language and may later show up with such variations as lisping and baby talk. The mothers of stutterers seem, from some studies that have been made of them, to be overprotective, tense, pessimistic, and high in the speech requirements they make of their children.[18]

An extreme illustration of the impact of psychological factors is shown in some forms of mutism. As Adams and Glasner[19] point out, there are a number of children who hear and understand, show no clinical evidence of organic involvement, yet do not speak and who are most resistant to intensive speech therapy. These children may have what is called "elective mutism." It is clear that these children are severely disturbed emotionally. It would seem that they have developed a defense mechanism as a means of avoiding a difficult and threatening environment. They erect a barrier between themselves and the threatening world. "This mechanism was most impressive when, in joy or excitement, a child would suddenly break through and verbally express a short clear sentence when otherwise sign language was substituted for speech."

Hearing Loss

Speech and language development quite obviously relate to adequacy of hearing. Although the hearing loss does,

in most cases, have an organic cause, psychological factors may be important. The child may be frustrated in his total attempt to relate to his social environment and may, as a part of this, withdraw or become unduly aggressive in his relationship with it. Either approach can markedly influence his speech and language development.

Just the fact that he cannot hear sounds excludes the child from the normal auditory contacts with his social environment which are basic to his speech development. This pattern can be accentuated if parents are overprotective of the child and will not, for example, accept and admit the handicap he has. This may lead them, because of emotional factors, to even resist having the child's hearing thoroughly analyzed by specialized medical personnel and may, in some cases, lead them to be emotionally upset over and even to resist having their child wear a hearing aid, an aid which would most certainly tend to make the child's language development and use more normal. Here again, the psychological impact on the child's speech and language development may be, although in some cases it is indirect, very great.

Intelligence

As Eisenson[20] and others have pointed out, there is little doubt that intelligence relates to better control and development of language although the exact relationship may be somewhat obscured because of the large part language plays in tests of intelligence. Mentally deficient children do talk later than normal children. However, even in this seemingly more obvious relationship between a psychological factor and speech and language development, complicating factors can enter in. The reports of parents of dull children seem to have a tendency to exaggerate the accomplishments of these youngsters when they were small and the total emotional pattern of some parents in relation to their children's intelligence can greatly influence how the children's speech and language will develop. A dull child who is pushed too hard can withdraw and, therefore, not accomplish even at his somewhat lower speaking and language level of ability. Bright children, too, can be pushed too hard because the parents are trying to accentuate their child's superiority. This may lead to abnormal speech characteristics such as stuttering. Fundamentally, however, studies that have been made of the area tend to support the idea that intelligence does correlate quite closely with language development.

Organic Defects

The significance of psychological factors in relation to speech and language can be further complicated when organic factors are involved. There is, first of all, the matter of tracing the etiological relationship between the organic deviation and the speech or language product. This was well illustrated in the case reported some years ago by Goldstein[21] of the man who, at middle age, had his tongue exterpated flush with the cornu of the hyoid bone. Organically speaking, this man certainly had every reason to have a permanent loss of speech. Yet, on his own and without professional help, the St. Louis plumber developed perfectly intelligible speech. Two persons with the same amount of malocclusion may show markedly different speech products, the one having severe articulation problems while the other has normal speech. As Spriestersbach[22] indicates, seemingly organic articulatory problems may be an expression of maladjustment. He believes that the dicotomy between so-called "organic" and "functional" defects of speech is in many ways false. The psychological reaction to a child who has organically based speech problems can be very influential in determining whether or not he will reach his maximum development. Hannigan[23] emphasizes this in her consideration of language and behavior problems of the "Rh Aphasic" child. As she indicates, adults and peers in the environment of such a child must be accepting of his level of development and yet must be supportively motivating to move the child toward his best efforts.

A special type of impact of psychological factors is considered by Morley[24] in her discussion of the child with cleft palate speech. As she points out, this

child may be unaware, during the early years of his development, and possibly even up to the age of seven or eight years, that his speech is different from that of others around him. However, when such a child finally discovers that he cannot communicate with others in his environment, particularly others outside his home, he is likely to become frustrated and bewildered. This may cause him to withdraw from normal contacts with people and to avoid speech, thus hindering the normal practice and progress he might make. In other cases, his speech may become aggressive and he may attack his environment through such characteristics as forceable use of the glottal stop.

Serious illness, particularly if it is prolonged, may have a marked effect on the child's total speech and language development. It may cut him off from the normal social contacts at crucial times in his developmental pattern and may, thus, delay his speech and language progress. Such illness may change the whole pattern of parental attitudes toward the child. Overprotectiveness may be increased, solicitude may become even greater. The parents, and in some cases subsequently the child, may develop a somewhat permanent pattern of being "not well" or "not strong," a pattern which can influence speech and language development directly in relation to the amount of adventuresome effort the person puts into his own speech and language growth. Because of his continued attitude of sickness or weakness, he may be restricted in or may himself restrict the kinds of social and interpersonal contacts which would be positively influential and valuable in developing his speech and language.

Brown[25] stresses significant psychological factors in relation to all persons who are physically handicapped. In dealing with any physically handicapped person, many people make the mistake of concentrating on the difference, the physical defect. They think of the child as a cleft palate girl, a cerebral-palsied boy or, in some instances, as a club-footed or blind or deaf or one-armed child. The child with all his longings, loves, hates, and talents is lost. His problem may be considered as being "organic" and the importance of the way he feels about his physical difference may be overlooked. Also important is what he thinks others are thinking about his difference. Many children with cleft palate, for example, make slow progress because they are not willing to talk to strangers or to talk in school since they feel the listeners do not like the way they talk. The best surgical treatment cannot alone give such a child good speech if he is painfully embarrassed when he talks to others.

Strange as it may seem, the child who is less severely handicapped organically may at times have somewhat greater psychological problems in relation to language and speech than those who are more severely involved. With a severe organic handicap present and evident, the social environment may make many concessions to this child and may not set up levels of expectancy or patterns of criticism which are frustrating and defeating. However, if the child is only mildly involved organically, the environment may make too great demands on him, not responding to or understanding the limits which his handicap imposes on him. This may cause dissatisfaction with and some rejection of what he does and may build frustrations in him which increase the difficulty for him to reach his maximum performance in many areas, including his maximum performance in speech and language.

Socioeconomic Status and Other Factors

Recent consideration has tended to emphasize, or at least call attention to, psychological facets of certain factors in language development which have, traditionally, been interpreted with a different emphasis. One of these is the home of low socioeconomic status.[8, 26, 27] The whole pattern of cultural and linguistic functioning in such homes is now being given greater prominence. One study, for example, of children in lower socioeconomic homes indicates that they ask fewer questions than those in upper socioeconomic level homes, hear little language in their homes, and do not

engage in much two-way conversation with significant adults in their home either before or after school. Thus, the socioeconomic factor in itself may not be as casually related to poor speech and language as linguistic patterns, patterns which are a part of the total psychological environment of the home.

A new look has been taken at the bilingual home. All studies of children who are exposed to two languages simultaneously in their homes in the preschool period show retardation in both languages. Recently, more emphasis has been placed on the emotional dynamics involved in such a situation. The language heard in early infancy has deep emotional roots for the child. The language relates to his parental culture and is one of the major means through which the child identifies with his parents in his early environment. It may be difficult for children to give up these emotional ties; the problem is complicated if they have any guilt feelings about using the parental language or if they feel that the language of their parents is taboo.[12]

Complicating the consideration of speech and language development is the fact that language disorders, when they appear, rarely appear singly or in isolation. One study[17] indicated that three fourths of nonreaders who were brought to a university clinic also had such problems as delayed speech, lisping, stuttering, or articulatory defects or had had them. A study of dysphemics[17] revealed that 25 per cent of them had reading and writing defects or some other type of speech defect.

General Remarks

Although the major phase of language relates to its communicative function and its place in relating to other people, what one's language does for the person himself is also extremely important. As Sullivan[28] points out, "So inadequate is the structure of our culture to our needs that language operations have to pertain not only to obtaining what we want but also to saving us from experiences, both real and imaginary, which we do not want. Getting what we want is, generically, securing satisfaction; avoiding what we do not want is the preservation of our personal security. Most children learn language more to preserve security than to secure satisfaction. It is an inevitable inference from the very nature of the culture that high cultural abstractions pertain more to the feeling of personal security among our fellows than they do to our biological satisfaction." Thus, very definite psychological aspects are involved in the development of a child's speech and language in relation to what it does for him, primarily perhaps in relation to establishing or maintaining his security.

Any consideration of the relationship of speech and language development to some other factor, such as the psychological, must take into account problems relating to the study of speech and language development itself. Many problems still remain in that area. Some of these are concisely stated by Templin[29] who has, over a number of years, carefully investigated language development in children. She indicates the still-present need for longitudinal studies of language, for a more detailed study of the impact of the environment on language development in children and of the interrelationship of language skills. She points out that there is still a real and unreached goal in the area of the construction of a scale of language development.

Emotional and psychological factors are made more difficult of analysis because they tend to operate in a circular fashion. The rejected child tends to feel rejected and, feeling rejected, develops patterns of behavior, such as patterns of speech and language behavior, which are inadequate and which may cause him to be rejected by even greater numbers of persons in more extreme ways. Failure builds on failure and frustration builds on frustration, just as really as success builds on success.

For each of the psychological factors discussed, there may well be some reader who is thinking, "Maybe, but I know a home in which ———," or, "I know a child who ———." Such examples stress a very important point. The impact of psychological patterns on a child's speech

and language development is not a simple thing. Seemingly, the influence of various factors operate differently on different children. Some children, for example, who seem to have been rejected may nevertheless develop normal speech and language patterns. Some may develop deviations in other areas. Some may at least seem to be "completely normal." Very careful analysis is needed to understand these differential influences. In some instances, it seems practically impossible.

A very great deal has been written about speech and language development in children. This paper can be considered, at best, only a brief consideration of some of the psychological factors related to that development. Its purpose has been to give at least some consideration to certain important areas and to indicate directions for further studies and research.

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Information relative to securing reprints of this study may be had by checking the Reader Service column on page iv of this issue.

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Clinical Problems in Speech and Language

Nancy E. Wood, Ph.D.
Cleveland

● Speech pathologists are concerned with the rehabilitation of a wide assortment of problems that impede or interrupt communication. Research has shown that speech and language disorders occur randomly throughout the population without regard for age, sex, race, or socioeconomic level. Since speech is a learned function, speech disorders, whether congenital or acquired, are either symptomatic of another problem or causally connected with a more basic disorder. For this reason, the speech pathologist most often functions as a part of a rehabilitation team. Speech disorders cannot be considered peripheral problems. Although disorders of voice, articulation, stuttering, hearing and aphasia, or associated problems of cerebral palsy or cleft palate are often brought to the attention of the speech pathologist, diagnostic information and suggestions for treatment must be available from all other personnel who have examined and/or treated the patient. The role of the speech pathologist must be removed from demands for miracles, for these demands can only result in quackery. Speech pathology must remain a scientific investigation with practical planning, imaginative procedures and hard work. Because of this wide diversification of speech and language problems, the aspect of language disorders will be emphasized in this report. In general, this discussion will be concerned with the rehabilitation of language disorders as they occur in both children and adults. More specifically, the subject matter will be related to aphasia, alexia and agraphia as caused by cerebral vascular accidents, brain tumors, or head injuries and congenital aphasia caused by anoxia, febrile episodes or birth injury. Clinical definitions of these problems, diagnostic needs and therapeutic suggestions will be presented.

In 1931, the White House Conference report indicated that an average of 5 per cent of the population, or approximately two and one-half million people, had speech or hearing problems that required professional attention. Apparently, these problems occur randomly throughout the population without regard for age, sex, race, or socioeconomic level.[1] A more recent study, completed in 1947, showed that more than 10 per cent of the school population had speech disorders.[2]

Types of Disorders

Since speech is a learned function, speech disorders are either symptomatically or causally related to more basic problems. The speech pathologist may be concerned with the examination or therapy for individuals with cerebral palsy, cleft palate, mental retardation, emotional disturbance, cerebral vascular accidents, postlaryngectomy, and other similar conditions. However, it is important to stress that these are causal factors and not a classification of the communication disorder itself. For example, a child with cerebral palsy may have a hearing loss, a voice problem, an articulation disorder, a language disorder, and he may stutter. Only a differential diagnosis of each individual's communication disorder can indicate the types or degrees of the problems present. However, if we were to segment communication problems into general classifications, five categories could serve our purpose: stuttering and disorders of hearing, voice, articulation, and language.

Hearing Loss. A hearing loss can be present at birth since some children are born with an impaired auditory system. These children do not hear sounds adequately and the development of language or speech is delayed or permanently limited. Educational procedures combine auditory training and speech reading. Progress in speech development is directly related to the degree of hearing loss present. Febrile episodes, encephalitis, meningitis, ear infections, and similar diseases can also cause a loss of hearing. In fact, a hearing loss can occur in anyone at any time. Often, it is a gradual process, as observed in geriatric populations. Regardless of the type of loss, or when it occurs, it is important clinically to stress that some types of deafness cannot benefit from amplification and a hearing aid is not always recommended. Even if diagnostic evaluation indicates that a hearing aid would be beneficial, the individual with a hearing loss, whether an adult or a child, must receive orientation in the use of a hearing aid and educational training in its compensatory use.

Medical science has contributed significantly to the prevention of hearing loss. Middle ear infections have been reduced by large and consistent numbers. Factors such as rubella and Rh incompatibility, causally connected with hearing loss in young children, are also being

Read at the Twenty-first Assembly of the American Academy of Physical Medicine and Rehabilitation (Seminar on "Rehabilitation in Speech and Language"), Minneapolis, September 1, 1959.

Associate Clinical Professor, Western Reserve University; Coordinator, Foundation for Children with Language Disorders; Director, Clinical Services, Cleveland Hearing and Speech Center.

studied by those concerned with preventive medicine.

A child or an adult with a hearing loss is first and foremost the responsibility of the otologist. The rehabilitation team also includes the audiologist, who is responsible, usually, for determining the degree of existing loss and for recommending a hearing aid when warranted. The audiologist and the speech pathologist are concerned with conserving residual hearing and for compensatory training of other sensory avenues as substitutes for hearing in as many functions as possible.[3]

Voice Problems. Voice problems are usually referred to the speech pathologist by the laryngologist. They can be divided into two major types: those caused by a physical disorder, such as vocal nodules or surgical removal of the larynx, and those where no physical problems can be found, such as hysterical aphonia. Some voice disorders may represent a combination of the two types, particularly those associated with voice strain, resulting in hoarse, raspy, or strident qualities. Some voice problems are associated with particular occupations where vocal misuse results in a voice disorder.[4]

Although less common in children than adults, voice disorders are identified frequently enough to suggest that they may actually occur in larger numbers of young children than clinical evidence indicates. It is possible that voice problems in young adults might be prevented if earlier detection were emphasized.[5]

Articulation Disorders. Articulation disorders may range from minor symptomatology of a substitution of one sound for another (such as a lisp) to a severely distorted and unintelligible speech. Often considered uncomplicated, articulation disorders are sometimes ignored with the supposition that time will eliminate the problem. Unfortunately, this is seldom true. An articulation disorder may be symptomatic of a hearing loss, an emotional disturbance, mental retardation, poor motor coordination, environmental pressures, poor or insufficient speech patterns, or even cortical damage. It is seldom caused by laziness or stubbornness on the part of the child. Superficially, an articulation disorder may appear to be rather minor; however, it may be one symptom of a more basic and major problem.[6]

Stuttering. Stuttering has stimulated more research than probably any other speech disorder. There are many theories concerning the causes and treatment of stuttering since this problem is symptomatic of a more basic disorder. Classified as a rhythm disorder, stuttering can range from simple uncomplicated hesitations in speech to severe spasm contortions which permit negligible verbal communication. The various types of treatments used for reduction or elimination of these pathological hesitations are complex in design and application. One basic fact is apparent. Stuttering is not a speech problem, but rather a communication disorder and therefore indicates a disturbance in interpersonal relationships. Because of this, symptomatic therapy is usually accompanied by a psychotherapeutic approach.[7]

Disorders of hearing, voice, and articulation, and stuttering are comparatively easy to recognize even though the etiology may be complex. The symptom of hearing loss in a child or an adult is a limited response to auditory stimuli. Voice problems are identified by abnormal voice quality or lack of vocalization. The symptom of an articulation disorder is the omission, substitution, or distortion of speech sounds. Stuttering is characterized by repetition of speech sounds or spasmodic blocking in the production of speech. Although there is, generally, professional agreement and public sophistication in recognizing the symptoms of these foregoing problems, the symptoms of language disorders are not so easily identified.

Language Disorder. The term "language disorder" refers to the inability or limited ability of the individual to use symbols for communication purposes. Symbols are selected arrangements of signs, primarily auditory or visual, which become meaningful through a process of association. A symbol is a word that represents or stands for an object, person, or thing. These symbols or words are articulated through speech in a struc-

tured pattern which is dictated by rules of grammar and syntax. Similar rules govern the letters in the word when it is translated to written form and spelling is substituted for articulation.

A language disorder is considered both a receptive and an expressive problem. The individual with a language disorder is usually unable to understand words through the auditory sensory channel, even though a hearing loss does not exist. Concomitantly, speech is limited because the motor patterns of articulation cannot be retained although the articulators are not physiologically involved.[8]

Caused by damage to the cerebral cortex or lack of development of the association pathways of the brain, language disorders vary in both degree and type.[9] Aphasia is a language disorder most frequently referred to specialists concerned with physical medicine and rehabilitation.

Less than 20 years ago one person could have discussed with intelligence and authority this entire field of speech and language disorders. As the foregoing discussion indicates, speech and language pathologists are concerned with such a wide diversification of problems that this is no longer possible. Therefore, the following remarks will be limited to a discussion of language disorders, more specifically aphasia, as it occurs in both children and adults.

Aphasia, or *dysphasia,* refers to an impairment of spoken language either in its reception or expression. Aphasia in adults usually results from cerebral vascular accidents, brain tumors, or cerebral injury. Aphasia in children is believed to be caused by severe febrile episodes, cerebral injury, or lack of development of the brain. Although the symptom of aphasia is an inability to understand or produce the spoken word, the problem cannot be considered one of speech production primarily. The problem is caused by the inability of the individual to receive spoken words because of a basic problem in the perception of stimuli and classification of symbols. The word "dog" may not be understood by the individual with aphasia, since the word itself has no perceptual meaning and no resulting concept. Although the individual may hear the words "cat," "dog," "house," "tree," and so on, the ability to associate the name of the object (or symbol) with the actual object itself is impaired. Because of this inability to comprehend the symbol, the individual cannot express himself adequately in words.[10]

The Adult with Aphasia

During World War II, when many young men sustained head injuries, the subject of aphasia received increased attention from both diagnostic and therapeutic standpoints. However, aphasia was recognized as a clinical syndrome in 1861, when Broca read his now-famous paper before the Academy of The Society of Anthropology, which established the loss of speech following pathological disturbance of the cortex.[11]

Although aphasia in adults results in the loss of speech, the aphasic patient often shows evidence of comprehension problems, confusion in thought processes, or lowered intellectual performance. It is necessary to differentiate aphasia from comprehension problems caused by mental deficiency, hearing loss, emotional disturbance, blindness, or specific motor involvements. This differentiation requires the combined medical specialties of neurology, physical medicine, and psychiatry. Rehabilitation services, such as occupational, physical, and speech therapy, must be available for the patient with aphasia. The medical social worker, the clinical psychologist, the family physician, and the patient's family are necessary and valuable contributors to rehabilitation plans. The need for a teamwork approach is taken for granted by specialists in rehabilitation services, but this often dissolves into mere lip service without dynamic inneraction of group evaluation.[12]

Usually, the aphasic patient is examined by several specialists before treatment or therapy is begun, and each specialist completes his evaluation within his particular area of competency. It has become apparent through clinical study that examination reports have been

almost exclusively concerned with the patient's condition immediately following trauma, with little consideration for his mental or physical condition previous to the trauma, or without realistic regard for future limitations. Rehabilitation plans are often hampered by reports that are incomplete or too complex. For example, the neurological report may be so terse that it is meaningless to those concerned with retraining. Or, the referring physician may send a brief letter to a speech therapist stating only, "This man is aphasic. He needs help." Conversely, the speech pathologist may indicate that the patient has dysarthria, anomia, agraphia, alexia, acalculia, or some similar condition, with such a detailed study of the patient's problem in communication that there are no positive statements upon which rehabilitation plans can be based.

This lack of pertinent information or complex reporting is not peculiar to just a few representatives of the rehabilitation team. In fact, one of the major problems in the rehabilitation of the aphasic adult is related to the poor integration of information and lack of personalized rehabilitation planning. It is suggested that all examination reports, regardless of specialty, would be more useful in rehabilitation planning if they were to include information concerning the premorbid history, the posttraumatic characteristics of the patient, and recommendations for rehabilitation.

Premorbid History

The premorbid history of the patient is of extreme importance if rehabilitative planning is to be realistic. It is reasonable to assume that if a patient were unable to perform certain activities prior to cerebral damage, he will not be able to perform these acts in a posttraumatic condition. Often there are complicating factors in the history. Where aphasia is suspected as a result of cerebral vascular accident, a report of diabetes or high blood pressure often accompanies the disorder. At times there are indications of previous emotional fluctuation, professional pressures, vocational dissatisfaction, or forced competition. Prior to the trauma the patient may have had difficulty making decisions or he may have suffered from overwork and fatigue. All patients suspected of having aphasia, regardless of cause, should be evaluated in terms of emotional stability, motivation, and adjustment to the problem. Their ability to accept the frustrations and anxieties which accompany aphasia should be realistically appraised. Speech and language retraining should not be undertaken before answers to the following questions are obtained: (1) Was the patient in general good health prior to the trauma? (2) Was his level of education in keeping with his occupation or profession? (3) Was he emotionally stable and intellectually adequate? Affirmative answers to these questions would permit more direct speech and language rehabilitation.[12]

Posttraumatic Characteristics

The adult with suspected aphasia usually shows a reduced ability to remember and limited ability to associate, organize, shift attention, or make decisions. In many cases, there is increased irritability, lack of initiative, feelings of inadequacy, disinterest, withdrawal from society, or distrust. At times the patient shows definite changes in personality with periodic evidences of anxiety, impulsiveness, confusion, delusions, or childlike behavior.[11] It is important to note that these personality characteristics are related to the cerebral damage and not to the problem of aphasia. If we remember that aphasia is primarily a language disorder, rather than a speech problem, it is apparent that a certain amount of intellectual integration must be present before retraining can be successful. Specialists concerned with rehabilitation must be able to answer such questions as these: (1) Does the physical condition of the patient permit an intensive retraining program without fear of undue fatigue or pressure? (2) Is the patient motivated to receive help from speech and language retraining? (3) Does the patient's family have an adequate knowledge and understanding of his problem? Negative answers to any of these ques-

tions will impede progress in speech and language retraining.

Although each specialist is concerned primarily with a particular area of rehabilitation, all areas must be integrated to be effective. It is, therefore, necessary for these specialists to plan concomitantly so that the goals are comprehensive and immediate. Rehabilitation planning cannot permit specialists to sit on academic pedestals. Their common aim is toward the patient's comprehension of what is expected of him and what he can expect of himself. From the therapy standpoint, the physical therapist is not concerned with muscles alone, nor the occupational therapist with vocationally acceptable dexterity, nor the speech therapist with the forming of words. In fact, some of the most practical speech and language retraining has been done while the physical therapist works with the patient. The occupational therapist may successfully apply some physical therapy technics to obtain the desired results. The speech therapist may find occupational projects excellent motivation for speech and language retraining.

The patient's family must be informed of the patient's limitations so that they can realistically plan for the future. Retraining plans should be explained and suggestions for home training procedures should be presented. It is often important to explain to the family, as specifically as possible, what the patient can do for himself so that he does not become dependent and so that motivation will not be repressed.

Insufficient time is probably the most detrimental factor in the planning, staffing, or interpretation of the problem. Nevertheless, lack of time is no excuse for negligence or impractical planning. So that practical goals can be established for each patient, the following questions, among others, should be considered: (1) What degree of intellectual deterioration is present in the patient and what are his intellectual limitations? (2) Will retraining permit this patient to return to his former vocation or must other plans be considered? (3) What are the permanent limitations of the patient with respect to physical independence, vocational placement, and communication?

Limitations of Language Retraining

We must realistically accept the fact that many adults with cortical impairment cannot benefit from speech and language rehabilitation services. A recent study of adults referred to the Cleveland Hearing and Speech Center for speech and language retraining following cortical damage, revealed that almost 30 per cent had multiple problems in addition to aphasia, to the extent that they were unable to benefit from speech and language therapy. In fact, use of the term "aphasia" could be questioned when applied to these patients, because of the multiplicity of their problems. Conversely, approximately 10 per cent of the patients referred were found to recover speech and language almost spontaneously and did not require speech and language retraining. The majority of the patients did benefit proportionately from speech and language retraining, but this improvement in communication was usually commensurate with over-all progress of the individual.

Rehabilitation for an adult with aphasia can be expensive in both time and money. Although it is important that each patient receive every available service from which he can benefit, it is equally important that impractical plans be avoided. The patient's family should not be drained financially or emotionally by unrealistic planning. The patient should not be urged to strive for goals which he cannot reasonably be expected to reach. Therapists should not be expected to produce positive results in an individual whose condition is irreversible. Generalized statements concerning aphasia can never substitute for a comprehensive and individualized evaluation of the patient. However, rehabilitation of adults with aphasia can be improved only through more realistic recognition of the patient's permanent limitations.

The Child with Aphasia

The diagnosis and treatment of aphasia in children is a comparatively new area

of study and there is still confusion in the classification or identification of this problem. Although the majority of children with aphasia have psychomotor behavior patterns that are similar to those observed in children who show neurological evidence of cortical damage, it is not always possible to produce this evidence in children with aphasia. Tests of mental abilities indicate that children with aphasia have normal or near-normal intellectual potential, although their responses to the test items which require integration and comprehension of symbols may be disturbed. Hearing evaluations show that these children have auditory patterns which are grossly inconsistent so that at one testing session they may respond to sound and at another they may not. Language evaluations suggest that children with aphasia are confused by auditory and visual symbols which result in severe learning disorders.[8]

Some children with aphasia are diagnosed erroneously as mentally retarded, emotionally disturbed, or deaf. Although the symptoms of aphasia may resemble other childhood disorders, aphasia must be differentiated from these other disorders if habilitative planning is to be effective.

Since aphasia is a disturbance in the use of symbols for communication, this factor differentiates this problem from other causes of delayed language development. Aphasia is not an integrated part of deafness, emotional disturbance, or mental deficiency. Although the deaf child does not develop speech normally, his lack of speech production is related directly to his inability to hear sound. It is important to note that deaf children may be able to integrate symbols for communication in all language functions that do *not* require sound. It is true that the mentally deficient child functions at a retarded symbolic level, but this is not his only area of deficiency. Language of the mentally deficient child develops in proportion to his mental age, and, usually, he functions at approximately the same developmental level socially, emotionally, and intellectually. The emotionally disturbed child may not use speech for communication, but his problem, like the others discussed here, is not causally connected with a disturbance in the use of symbols. Therefore, before habilitation planning can be effectively executed, the child with aphasia must be differentiated from other children who do not use speech adequately for communication.

As stated previously, aphasia in children is currently believed to be caused by damage to or lack of development of the brain. Cortical damage can cause many types of children's disorders. Since the development of language depends upon normally functioning sensory pathways, mental abilities, and psychological avenues,[8] damage to any one or combination of these functions can hinder language acquisition. Therefore, it is important to stress that, although aphasia is caused by cortical damage, all cortical damage does not result in aphasia.

The diagnosis of aphasia in children, or adults, cannot be made merely because all other possible diagnostic classifications have been excluded. Stated differently, if the diagnostic evaluation indicates that a child is *not* mentally retarded, *not* deaf, and *not* emotionally disturbed, and if other clinical classifications have been negated also, it is equally important to realize that the problem may *not* be aphasia. The diagnosis of language disorders is not advanced enough to support this process of elimination for there are too many causes of delayed speech acquisition of which we are unaware.

The rehabilitation of the child with aphasia requires an educational approach that is designed for this particular problem. Other educational processes currently used for children with other disorders will not produce maximum results. For example, the mentally retarded child, because of the permanent nature of his problem, requires drill and repetition in order to retain, within his limitations, basic educational principles. The emotionally disturbed child is usually seen in a permissive atmosphere with a psychoanalytic orientation. The deaf child requires auditory training and speech reading with specific educational procedures that are designed to help him

compensate for his hearing loss. The child with aphasia must also have rehabilitative planning that is directed toward his specific problem. Since he has limited ability in the use of symbols, the aphasic child must be helped to organize incoming stimuli for meaningful communication.

The educational needs of the child with aphasia are creating nationwide concern among those interested in the therapy of children's disorders. Several residential programs with facilities and staff for the education of such children exist at the present time, but the tuition is usually a minimum of $6,000 per year. Obviously, these programs are not financially possible for families with moderate incomes. Nonresidential programs and professionally trained language pathologists are at a minimum. State aid, often available to the mentally retarded, blind, or deaf child is currently denied the child with aphasia. This frequently tempts the diagnostician or clinician to emphasize the child's inconsistent auditory responses or his confusion in certain intellectual performances, so that these children can receive educational consideration by being accepted for programs designed for the deaf child or the mentally retarded child. However, refusal to classify the problem is no answer for a disorder that is recognized with increased accuracy and incidence.

Summary

Although this discussion has emphasized the language rehabilitation of the adult or child with aphasia, much of what has been said here can be applied to all types of speech and language disorders. Speech and language therapy must be integrated with the total rehabilitation plans for the patient. In order to do this, the speech pathologist must receive complete and informative reports from physicians, psychologists, social workers, and others concerned with the patient, *prior* to the speech and language evaluation. Some patients cannot benefit from speech and language therapy and are seen for evaluation only. The problem must be differentially evaluated by the speech pathologist and only those individuals who give evidence of a positive prognosis should be accepted for speech and language rehabilitation.

It should be emphasized that a speech pathologist cannot perform miracles, nor should he be considered a baby-sitter, a classroom teacher, or a kindly next-door neighbor. Speech pathology, as a science, has recognized contributions and realistic limitations. Therefore, speech therapy should not be recommended merely because it is considered harmless. It is not enough for a profession to be innocuous; its contribution must be positive.

By general standards, speech pathology is a new area of study and requires continued research in terms of causal factors and therapeutic procedures. It is apparent that communication disorders are not remedied by time alone and the incidence of recognized speech and language disorders is increasing. This suggests that the results of future research projects will have wider application to the total study of rehabilitation procedures if there are more opportunities to share information. It also suggests that increased numbers of speech pathologists will be educated in the future, which will require interdiscipline cooperation and education. Rehabilitation procedures include many widely diversified professional disciplines. It is our hope that the field of speech pathology will contribute in the future as effectively and as unselfishly to the study of rehabilitation as these many other professions have contributed in the past.

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Information relative to securing reprints of this study may be had by checking the Reader Service column on page iv of this issue.

Correction, please —

The table appearing in the study, *Comparative Study of the Efficiency of Short-Wave, Microwave and Ultrasonic Diathermy in Heating the Hip Joint* (December, 1959; p. 512) by Justus F. Lehmann, et al, should read

Rise of Temperature (°C) in Hip Joint During Application of Diathermy

Modality	Output	Duration of Treatment (Min.)	Number of Exposures	Pre-Treatment Temperature (Mean)	Change in Temperature Inside Hip Joint	
					Mean	Standard Deviation
Ultrasound*	1.5-2.0 w/cm²	5	6	39.79	1.43	.479
	2.5 w/cm²	5	12	39.62	4.01	.660
	3.0 w/cm²†	10	7	39.34	.48	.060
Microwave	50-80% with C-director at 1-2 inch spacing	20	17	39.58	.10	.088
Short wave	90-110 ma. with drum applicator at 1-2 inch spacing	20	11	40.05	.30	.136

*Radiating surface of applicator: 12.5 cm²
†Thermistor located inside hip joint capsule on the opposite side from area treated.

Pardon our error . . .

Regarding the Beth Abraham Home at 612 Allerton Avenue, Bronx, N. Y. This institution is a voluntary nursing home affiliated with and receiving its major philanthropic support from the Federation of Jewish Philanthropies. It has 530 beds and its rehabilitation service was developed by its director, Doctor Hans J. Behrend.

Self-Help Prosthetic Device to Facilitate Locking and Unlocking of Long-Leg Braces

Folke Becker, M.D.
Dublin, Ga.

● The "Boomerang" is a device that might make the difference between a patient being able or not being able to extend his long-leg braces to the lock position without aid. This device is offered on the chief merit of overcoming these mechanical disadvantages aside from the fact that it facilitates the use of weakened upper extremities and reduces overall energy and man hour costs. The "Boomerang" is extremely rugged and repairs are seldom necessary even after years of continuous use.

A principle which enables the patient to lock and unlock his long-leg braces with ease and without assistance from others is described. It is extremely difficult for a patient wearing long-leg braces to extend the braces to the knee-lock position while seated *comfortably*. This difficulty is even greater where there is any degree of spasticity in flexion such as seen in paraplegias and hemiplegias. Bending forward at the hips in any effort to extend the knees greatly increases the difficulty by putting stretch on the hamstring muscles.

The "Boomerang" leg brace extension device has been extensively hospital tested and during the past year has been in successful daily use at home by several paraplegic patients. Using the "Boomerang" in any case where the knee is mechanically capable of full extension, knee locking in extension can be readily accomplished by paraplegics in whom this act is normally very difficult without assistance from another person, or without sitting precariously on the edge of the wheelchair or bed with the heel resting on a point of counterpressure such as the floor. It is possible with this device to produce knee extension while also extending the hip rather than bending forward to support the leg or apply downward pressure. The savings in man hours made possible by the "Boomerang" amount to at least one-half man hour daily per patient. This device has a secondary use in permitting patients with short leg braces to perform active assistive exercise of a weak lower extremity.

Specifications

The main bar of the "Boomerang" leg extension device is made of standard ¼ inch x 1 inch hot rolled steel, 27 inches in length (fig. 1). The proximal arm, A-B, is 17 inches in length, including the grip. The distal arm of the "Boomerang," B-C, is 10 inches in length. To this arm, the double hooks are welded. The hooks are ⅛ inch x ¾ inch x 5 inches, and of continuous hot rolled steel welded solidly to the "Boomerang" at points F and C, as shown in figure 1. Distance from B to F is 2 inches. Double hook at C is flush with the end of the "Boomerang." All hook gaps must be ½ inch in width. The sides of the hook are ¾ inch deep on the inside and ½ inch deep on the outside. Figure 2 illustrates this point. The knee-brace to support the "Boomerang" angle against spreading, is of ⅛ inch x ½ inch x 20 inches hot rolled steel and firmly welded at points E and D as

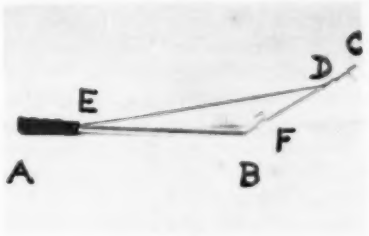

Fig. 1

Fig. 2

Read at the Southeastern Area Conference of VA Physical Medicine and Rehabilitation Chiefs and Coordinators, Dublin, Ga., November 20-21, 1958.

Chief, Physical Medicine and Rehabilitation Service.

This material has been reviewed by the Veterans Administration and is published with the approval of the Chief Medical Director. The statements and conclusions of the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

shown in figure 1. Hooks at F have the gaps facing down; those at C have the gaps facing upward. The device can be applied to any side of either leg brace. Bicycle grip is vulcanized or tightly wedged to proximal end of main bar. The device should be aluminum painted or chromed to prevent rusting. Overall weight of "Boomerang" is 2¼ pounds; the cost of labor and materials to produce the apparatus is $4.17.

Fig. 3

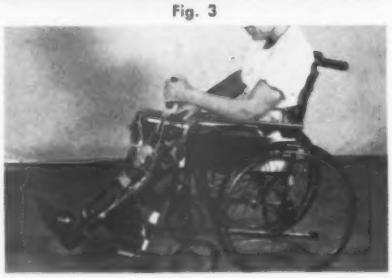

Fig. 4

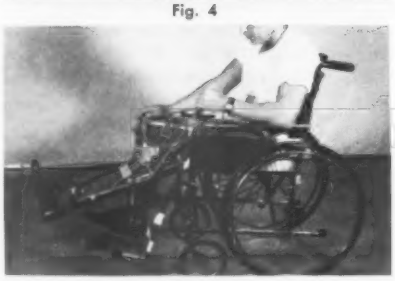

Fig. 5

Discussion

Figure 3 illustrates the starting position for knee extension. Note that the boomerang feature of this device permits a great component of pull in the long axis of the femur practically throughout the extension phase.

Figure 4 shows the leg not quite fully extended. It is within these last few degrees of full extension that devices heretofore proposed have fallen short in that there has not been sufficient offset provided for pull rather than downward push. The angle at B should be 130 - 140 degrees for optimum mechanical advantage.

Figure 5 shows the leg fully extended and locked. It can readily be seen that while comfortably and safely seated the patient still has plenty of room. Without the boomerang feature (e.g. straight bar) the patient would have to move forward in the seat and would have to apply all pressure in a downward direction, or push, at this phase of the procedure.

Torque, spring, and tissue yield, would add to the difficulty where a straight lever is employed in the last few degrees of extension. Torque is a negligible factor in the use of this device.

Conclusion

The "Boomerang" is presented not only as a time-saver, but as a device that might make the difference between a patient being able or not being able to extend his long leg braces to the lock position without human aid. No degree of upper extremity strength can fully overcome the mechanical disadvantages of having to lock and unlock the knee of long leg braces manually. The "Boomerang" is offered on the chief merit of overcoming these mechanical disadvantages aside from the fact that it does facilitate the use of weakened upper extremities and reduce overall energy and man hour costs. Since the entire device constructed of welded, hot rolled steel, weighs only 2¼ pounds, and is handled quite easily by the average patient having paralyzed or weakened lower extremities, the weight-strength relationship should not be changed. Lighter materials should not be used if this necessitates any reduction in strength. The "Boomerang," as described, is extremely rugged and repairs are seldom necessary even after years of continuous use.

Information relative to securing reprints of this study may be had by checking the Reader Service column on page iv of this issue.

New Type Ergograph

Donald K. Mathews, D.P.E.
Columbus, Ohio
Kalman L. Pell
and
Norman H. Shoup
Pullman, Wash.

● An ergograph built by the Division of Industrial Research through cooperation with the Fitness Laboratory in the School of Physical Education at the State College of Washington is described and illustrated.

The ergograph is an extremely useful laboratory instrument employed as an aid in finding the answers to such questions as: (1) effect of various exercise intensities and frequencies on muscular hypertrophy, (2) bilateral effects of unilateral exercise, (3) efficiency of isotonic and isometric type exercises, and (4) circulatory changes accompanying exercise.

A variety of ergographs has been used in the laboratory since the investigations of Mosso in the latter part of the 1800's.[1] One of the most popular kinds today is that built by Kelso and Hellebrandt,[2] similar to the machine first constructed by Treves.[1] This wheel-and-axle type instrument used primarily with the elbow flexor muscle group has the advantage of permitting the application of the resistance to remain at a constant angle throughout the range of motion. A few of the disadvantages are: (1) the repetition meter employed in measuring the distance the load weight travels frequently may be inaccurate and for each muscular contraction the error becomes cumulative, (2) loading this type ergograph is cumbersome and time consuming, (3) as the weights are raised on the carriage considerable friction may be present in the mechanism, and (4) there is not an effective means of obtaining a graph of the exercise results.

To circumvent some of these problems the following ergograph was built by the Division of Industrial Research through cooperation with the Fitness Laboratory in the School of Physical Education at the State College of Washington. Figure 1 is a line drawing taken from an actual photograph of the ergograph. Figure 2 demonstrates the use of the instrument for exercising the elbow flexor muscles.

Weight selection range is 5 to 100 pounds. With the crank are (*D*, in fig. 1) set at an 8-inch radius, the lever ratio of this machine is unity. This number is the ratio of the pitch radius of the pulley to the crank length. The subject will then exert a force equal to the load on the elevator platform in order to raise the weights. If the crank length is changed to 16 inches, for example, the lever ratio would then become 1:2 and the subject would only have to exert one-half as much force to overcome the same load on the elevator platform. It seems logical, from this standpoint at least, that researchers, when reporting ergographic results, should also indicate the lever ratio of their machines.

The eight guide rollers (*E*, fig. 1) reduce friction of the moving weight carrier. The continuous chart of the electric kymograph (*F*, fig. 1) has four speeds: 9.25″/min., 18.25″/min., 22.75″/min., and 45.25″/min. A 90 degree rotation of the pulley shaft causes a 4.5-inch pen travel, or .347 inches per line on the kymograph paper. The adjustable and fixed stops on the pulley (*H* and *I*, fig. 1) limit motion.

References

1. Handbuch der biologischen Arbeitsmethoden, edited by E. Abderhalden, Berlin,

Professor and Coordinator of Research, Department of Physical Education, Ohio State University; formerly, Department of Physical Education for Men, School of Physical Education, State College of Washington, Pullman.
Division of Industrial Research, State College of Washington.
Division of Industrial Research, State College of Washington.

This investigation was supported in part by funds provided for biological and medical research by the State of Washington Initiative Measure No. 171.

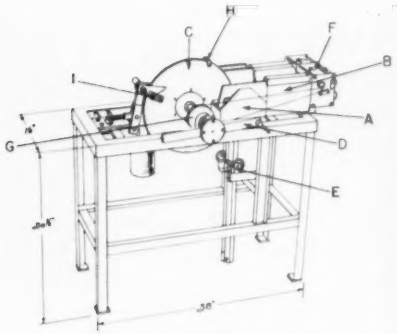

Fig. 1 — Drawing of ergograph: *A*, carrier or elevator platform for weights; *B*, storage container for weights; *C*, single-groove, 16-inch diameter pulley and cable to raise and lower elevator platform; *D*, adjustable crank arm; *E*, guide rollers; *F*, kymograph; *G*, drive drum for kymograph; *H* and *I*, adjustable and fixed stops on pulley.

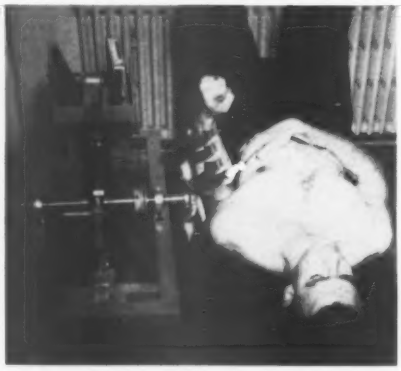

Fig. 2 — Position for exercising the elbow flexor muscle group.

Urban & Schwarzenberg, 1936, section V, part 5A, pp. 174, 185.

2. Clarke, H. H.; Shay, C. T., and Mathews, D. K.: Strength Decrement of Elbow Flexor Muscles Following Exhaustive Exercise. Arch. Phys. Med. **35**:560 (Sept.) 1954.

Further information concerning construction of this machine may be obtained by writing to Head, Technical Extension Services, Washington State Institute of Technology, State College of Washington, Pullman, Wash.

Information relative to securing reprints of this study may be had by checking the Reader Service column on page iv of this issue.

"We are all of us so hard up nowadays that the only pleasant things to pay are compliments. They're the only things we can pay."

◇ OSCAR WILDE

editorial

What Is An Abstract?

As the Program Committee of the Third International Congress of Physical Medicine begins to organize the papers to be offered during the scientific sessions, it appears that there will be a varied and interesting program. Electromyography, evaluation and treatment of neurological diseases, arthritis and scoliosis, the rehabilitation of paraplegic and quadriplegic patients, and the psychological, social and vocational problems which always arise in the rehabilitation of the severely handicapped are among the topics to be considered. The 3rd International Congress of Physical Medicine, like the preceding two international congresses, has required that all applicants for participation in the scientific sessions prepare and submit abstracts of the material which they wish to present. The purpose of this requirement is twofold. The Program Committee is aided when setting up the preliminary program by the information obtained from the abstracts. More important, the registrants at the 3rd International Congress, by reading the abstracts, can select the papers which are of the greatest interest to them.

To serve these two purposes the abstract of any article should present in concentrated form the essential information contained in that article. An abstract should provide information. A published abstract is credited as is a scientific publication for the information which it contains.

An abstract which is a vague generalization of a problem fails to fulfill its purpose of informing the reader concerning the merit of the paper whether published either before or after the publication of the paper. An abstract which reviews material published prior to the research of the author is noncontributory to the needs of its readers. Writers of abstracts who are disciples of obscurantism might be suspected either of reporting on anticipated research or of writing with nothing to report. In either case, the reader does not feel justified in spending time on such a paper.

This comment was stimulated by the observation of the writer that a certain proportion of abstracts for previous scientific sessions of the American Congress of Physical Medicine and Rehabilitation as well as a number of abstracts presented for the 3rd International Congress of Physical Medicine failed to fulfill the purpose of presenting concisely the new information which the author will report in his paper before that scientific body. As a result, the Program Committee has found itself unable to accept certain papers because the generalizations contained were neither new nor contributory and appeared to have nothing to offer to the body of knowledge in our field. Some applicants for participation in the scientific sessions will fail to be accepted for the program because their abstracts did not indicate the value of their papers. This will be unfortunate. However, it is the duty of a Program Committee to select the best possible program, avoiding material which is repetitious and noncontributory. An abstract which does present clearly and succinctly the essential contribution of the results and conclusions of its author, is advantageous both to the author and to the readers of that abstract.

— Frederic J. Kottke, M. D.

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survey of selected literature

This systematic abstracting and indexing of selected journals is made possible by a grant from the American Rehabilitation Foundation, a subsidiary of the Sister Elizabeth Kenny Foundation.

PEDIATRICS. *Vol. 24, Dec. 1959.*

◇ **Perinatal Asphyxia and Psychologic Signs of Brain Damage in Childhood. Frances F. Schacter, and Virginia Apgar. pp. 1016-1025.**

The authors report on the results of a second follow-up study of an unselected sample of infants born in 1948-1950 who were investigated for the possibility of perinatal complications and neonatal anoxia. Children with known brain damage were excluded for this testing done in 1957.

Twenty-three psychological tests and signs were used to evaluate evidence of brain damage including the Wechsler Intelligence Scale for Infants, Bender-Gestalt, Sorting test, Goodenough I.Q. test, Figure-Ground, Marble board, Rorschach, Critical Flicker Frequency, Fels' Behavior Rating, the child's mother's rating, the psychologist's rating of behavior, and the report card from school.

There was a significant but slight (4.87 IQ points) decrement on the W.I.S.C. correlating with poor performance on the Bender-Gestalt, Sorting (especially unusual selections) and a lower flicker rate on the Critical Flicker Fusion for children who had histories of obstetrical complications, prematurity, resuscitation, or combinations of these. The test results did not correlate with determinations of heel blood O_2 content shortly after birth, perhaps because of technical problems of obtaining or interpreting O_2 content, or perhaps because of factors in the testing itself.

◇ **Transient Synovitis of the Hip Joint in Children. Alexander Spock. pp. 1042-1049.**

Forty-seven patients under the age of 14 who were treated for transient synovitis of the hip between 1953 and 1957 were studied by means of throat cultures, blood cultures, lumbar punctures, antistreptolysin titers, erythrocyte sedimentation rates, tuberculin tests, height and weight determinations, and virus antibodies where these tests were pertinent.

All patients showed limitation of passive range of motion in the involved hip. Ninety-five per cent had pain in the hip, thigh, knee, or a combination of these. It is of great importance to note that approximately one in seven of these patients had pain *only* in the knee, or thigh and knee, with no reference to pain in the hip. Local tenderness and swelling were infrequent findings.

Seventy per cent of these patients had acute infections of the upper respiratory tract at or within two weeks prior to the time of onset. Coxsackie B virus was implicated in one patient, B hemolytic streptococcus in four others. Obesity or "stocky build" occurred three times as frequently among these patients as would be predicted for normals of these ages.

Allergy and trauma were found not to be more frequent in the histories of the patients than in the population at large.

Of interest to the clinician is the observation that those patients who failed to maintain the prescribed bedrest during convalescence continued with symptoms almost twice as long (25 days average) as the children who were able to remain in bed (13 days average). Use of antibiotics did not appear to shorten the duration of hip symptoms.

This is a study with much useful information, but would have been strengthened had it been possible for *all* subjects studied to have had nose and throat cultures, blood cultures, antistreptolysin titers, and viral antibody studies.

Examination of the urine in pyelonephritis. *Rubin, Mitchell I. p. 977.*

Aspects of bilirubin metabolism — before and after birth. *Dancis, Joseph. p. 980.*

Comparative bacteriologic study of urine obtained from children by percutaneous suprapubic aspiration of the bladder and by catheter. *Pryles, Charles V. p. 983.*

BRAIN. *Vol. 82, Part III, 1959.*

◇ **Disorders of "Simultaneous Perception" in a Case of Bilateral Occipito-Parietal Brain Injury. A. R. Luria. pp. 437-449.**

This is a report of the history and findings on a young man who suffered a bullet wound of both occipital lobes and of the splenium of the corpus callosum, or the white matter of both occipital lobes. Although he showed left hemiplegia, motor aphasia and complete loss of vision early, he subsequently showed good recovery. It is reported that he had complete return of language (Russian and Polish), general intelligence and problem-solving ability, and emotional stability. The patient complained of difficulty in seeing, that objects flashed before his eyes which sometimes disappeared.

There follows a detailed description of neurological, visual and perceptual evaluations. The defect in vision appeared only when the visual field contained a number of separate elements. There was constriction of the visual fields, especially the left. He could write well with either Roman or Cyrillic script when his eyes were closed, but not while looking at the page. He had little ability in visual synthesis or spatial orientation.

Caffeine given "by injection" produced improvement in all areas, starting within 15-20 minutes, reaching maximum at 30-35 minutes, and disappearing within 1-1½ hours.

The author, from the University of Moscow, gives some arguments from these observations in support of Pavlovian theory of cortical activity. The detailed description of testing technic and findings will be of interest to all those working in rehabilitation of patients with neurological diseases.

◇ **Specific Developmental Disorders of Speech in Childhood. T. T. S. Ingram. pp. 450-467.**

Eighty children (58 boys and 22 girls), almost all under five years of age, were examined because of retardation in development of specific speech sounds without mental or experiential retardation as causative factors and with no physical disease as basis. Most of these children were from the upper socio-economic class of Edinburgh, Scotland, probably because of a social factor of selection and not because this disability occurs more frequently by class. Eighteen of the children had one or both parents with a history of similar or related defect. Twenty-three of the siblings had similar findings, even though many of the siblings of these children were too young to have developed speech. There were abnormal birth histories in 15 children, and transient neonatal abnormalities were noted in 16 children. The histories of motor development were not particularly unusual. Hearing was found to be adequate although many of the children had been suspected for deafness prior to this evaluation.

Examination of the children showed less lateralization of hand and foot use than in uninvolved children of the same age group. Intelligence quotients were low average or better in 78 of the 80, although there was a tendency toward poor performance in subtests of comprehension and vocabulary. Among the older children, half showed reading and writing disabilities. Approximately half the entire group showed psychiatric symptoms and almost all showed deterioration of performance in anxiety-provoking situations.

The author speculates concerning the relation of this specific developmental disorder and other speech problems, including "congenital aphasia" and congenital articulatory apraxia. It would have been very helpful to have had information concerning the details of visual perceptual and visual performance areas, as well as information on some of the psychological tests which tend to demonstrate evidences of organic brain damage in the intellectual areas. The syndrome which the author is describing appears to be but one in a sequence of mild to more severe organic brain disorders and should lend itself to even more detailed description than the present extensive statistical study attempted.

Observations on the extensor plantar reflex and its relationship to the functions of the pyramidal tract. *Brain, Russell, and Marcia Wilkinson. p. 297.*

The plantar reflex in man. With special reference to some conditions where the extensor response is unexpectedly absent. *Landau, William M., and Margaret H. Clare. p. 321.*

Subarachnoid hemorrhage. *McKissock, Wylie, and Kenneth W. E. Paine. p. 356.*

Redistribution of blood to the brain due to localized cerebral arterial spasm. *Potter, John M. p. 367.*

The visual changes in temporal (giant-cell) arteritis. Report of a case with autopsy findings. *Crompton, M. R. p. 377.*

Pregnancy as a factor influencing relapse in disseminated sclerosis. *Huszak, I. p. 427.*

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JOURNAL OF PHYSIOLOGY. *Vol. 148, Nov. 1959.*

◇ **Intramuscular Propagation of Sensory Impulses. A. S. Paintal. pp. 240-251.**

A technic is described for determining the intramuscular conduction time of impulses traveling in afferent fibers from muscle stretch receptors. The method involves stimulation of stretch receptors by a brief pull and determination of the length of time from the pull to the appearance of the impulse. Pull-impulse latency times varied as the time of a preceding antidromic stimulus or orthrodromic impulse was altered. From these measurements intramuscular condition times were calculated.

Assuming conduction velocity to be constant from sensory ending to spinal cord, the intramuscular conduction distances of the sensory fibers were also calculated. The position of ten stretch receptors in the tenuissimus muscle of the cat was verified by crushing the muscle.

The determinations of intramuscular conduction times and distances indicate that there is probably no propagation of the nerve impulse in the non-myelinated endings of the stretch receptors and hence these endings are probably associated with local non-propagated events.

◇ **Facilitation and Depression of Muscle Stretch Receptors by Repetitive Antidromic Stimulation, Adrenaline and Asphyxia. A. S. Paintal. pp. 252-266.**

Utilizing the technics described in the foregoing study by Paintal, changes in recovery of excitability of the sensory endings of the stretch receptors in the gastrocsoleus muscle of the cat were studied under different conditions.

Following tetanic antidromic stimulation the steady discharges from stretch receptors were abolished. This depression was probably due to elevation of the threshold at the first node of Ranvier of the efferent fiber and not due to reduced recovery of the endings. This is of physiological significance in the case of two endings connected to the same afferent fiber since activity in one ending will depress the response of the other. Also, since the effects of orthodomic impulses are similar to antidromic discharge, this depression may be a responsible component of the "off effect" phenomenon in sensory endings.

Adrenaline initially enhanced recovery of some endings but eventually always depressed it for long periods. This depression was probably secondary to the asphyxia of vasoconstriction since asphyxia when produced by the discontinuation of respiration always depressed recovery of the endings.

Peripheral effects of nicotine and acetycholine resembling those of sympathetic stimulation. *Burn, J. H.; E. H. Leach; M. J. Rand, and J. W. Thompson. p. 332.*

Effect of frequency of electrical stimulation on the concentration of intermediary metabolites in mammalian non-myelinated fibers. *Greengard, P., and R. W. Straub. p. 353.*

The interrelationship of weight change and coronary flow in the isolated perfused rabbit heart. *Stubbs, J., and W. F. Widdas. p. 403.*

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NEUROLOGY. *Vol. 9, Dec. 1959*

◇ **Degenerative Cerebellar Ataxias. Joe R. Brown. pp. 799-805.**

This study reviews the symptoms and signs found in 103 patients with degenerative cerebellar ataxia seen at the Mayo Clinic in 1957. The study includes ataxias of genetic origin as well as those of uncertain cause. Patients with convincing evidence of specific illnesses are ex-

cluded. As far as the age of the patients at the time symptoms were first noted was concerned, two distinct groups were found. Peak incidences were found in the age group from 0 to 19 years and 50 to 69 years. In the second group males predominated 2 to 1. The duration of the ataxia was up to 41 years with a median of three years for all patients.

Only 15 per cent of the patients revealed a history of a similar or related condition in other members of the family. In most instances the ataxic gait preceded and was more pronounced than limb ataxia. The entire group could be classified into three forms of degenerative cerebellar ataxia, namely normoreflexic, hyporeflexic and hyperreflexic. The patients with normal reflexes had a paucity of other neurologic signs. In the hyporeflexic patients signs referable to the spinal cord and peripheral nerves were prominent as was pes cavus and scoliosis. In the hyperreflexic form a predominance of pyramidal and extrapyramidal signs existed. Cranial nerve and brain stem involvement, as well as mental aberration, was present in all three forms with equal frequency.

◇ **Causes of Polyuria and Polydypsia in Patients with Injuries of the Cervical Spinal Cord. Meyer Brown; Stanley Pyzik, and John R. Finkle. pp. 877-882.**

The water metabolism of 59 patients with injuries of the cervical spinal cord were studied In all cases at least 6 months had elapsed since the time of injury. Approximately one half of the patients had complete interruption of function while in 29 patients the cervical cord lesion was incomplete. Fifty-three patients excreted over 3,000 cc. of urine daily and 40 excreted over 4,000 cc. The authors discuss water metabolism with respect to sweating, thirst, the vagus nerve, the relationship of the nervous system to renal function, diabetes insipidus, and the relationship of the spinal cord to water metabolism. In addition pitressin, given intramuscularly, was found to reduce markedly polyuria and polydypsia.

The authors conclude that interruption at the cervical cord of neural pathways is responsible for a diabetes insipidus like syndrome in these patients and that descending impulses from the hypothalamus to lower centers of the spinal cord when blocked are important in producing diabetes insipidus.

A case of atonic cerebral diplegia with lissencephaly. *Druckman, Ralph; Dora Chao, and Ellsworth C. Alvord, Jr. p. 806.*

An evaluation of electroencephalography, cerebral infarction, and ischemia due to arteriosclerosis. *Birchfield, R. I.; W. T. Wilson, and A. Heyman. p. 859.*

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JOURNAL OF APPLIED PHYSIOLOGY. *Vol. 14, Nov. 1959.*

◇ **Change in Intravascular Temperature During Heavy Exercise. Brian J. Sproule, and Richard J. Archer. pp. 983-984.**

The temperature of the blood in the brachial artery, brachial vein, and femoral vein was measured in five healthy men, age 18-27 during and after exercise. The temperatures were recorded from especially designed thermistor probes which had been threaded through catheters into the blood vessels. The subjects ran for 2.5 minutes at a level approximating that previously found to produce maximum oxygen intake. Temperature readings were made at one minute intervals during the exercise and also at one-half, 1½, and 7½ minutes after stopping the exercise.

There was a slight but definite rise in the temperature of the arterial and venous blood during heavy exercise which disappeared in five to seven minutes following cessation of exercise. The magnitude of increase averaged 0.49° for the brachial artery and venous blood, and 0.67° for femoral venous blood.

These results suggest that the increase in temperature may play a role in causing the rightward shift of the oxygen dissociation curve during heavy exercise over and above that caused by pH change.

◇ **The Effect of Food Deprivation on Treadmill Running in Dogs. D. R. Young. pp. 1018-1022.**

Effect of food deprivation on endurance capacity was studied in beagle dogs after three and five days of fasting with daily high levels of energy expenditure and after 15 days of fasting with low daily levels of energy expenditure.

After five days of fasting the maximum work capacity in dogs not given water during work was not significantly different than in the control period. However, when the dogs were given water during work, the maximum work capacity was 74 per cent greater than in the control period. Also, in the fasting dogs given water ad libitum during work, the work respiratory quotient, the blood lactate and acetone levels were unchanged. The resting blood glucose dropped from 86 mg. per cent during the control period to 69 mg. per cent on the fifth day of fasting. The post exercise glucose was 47 mg. per cent during the control period and 64 mg. per cent after the fifth day of fasting.

Capacity to do moderate daily work after 15 days fasting was maintained despite a 22 per cent weight loss.

The dog is remarkably resistant to starvation ketoses when given water during work. Fat was utilized as a source of energy but apparently sufficient carbohydrate was available for complete oxidation of fatty acids via the citric acid cycle. Two explanations can be offered to explain this increased maximum performance after fasting. It may be simply related to the reduced physiologic cost of work associated with changes in body weight or it may be due to a unique permissive effect of inanition, particularly on the ability to mobilize body energy reserves.

Metabolic studies on the perinatal human brain. *Himwich, W. A.; H. B. W. Benaron; B. E. Tucker; C. Babuna, and M. C. Stripe. p. 873.*

Psychogalvanic response as a pain reaction component. *McKenna, A. E. p. 881.*

Maximum oxygen intake in maximum heart rate during strenuous work. *Wyndham, C. H.; N. B. Strydom; J. S. Maritz; J. F. Morrison; J. Peter, and Z. U. Potgieter. p. 927.*

Polarographic studies of skin oxygen tension following sympathetic denervation. *Davis, M. T., and N. M. Greene. p. 961.*

Respiratory and cerebral circulatory controls during exercise at .21 and 2.0 atmospheres inspired pO_2. *Lambertsen, C. J.; S. G. Owen; H. Wendel; M. W. Stroud; A. A. Lurie; W. Lochner, and G. F. Clark. p. 966.*

A modified harvard step for women. *Sloan, A. W. p. 985.*

Effect of time after feeding and carbohydrate or water supplement on work in dogs. *Young, D. R.; A. Iacovino; P. Erve; R. Mosher, and H. Spector. p. 1013.*

A highly sensitive, miniaturized, photoelectric plethysmograph. *Rawson, R. O. p. 1049.*

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JOURNAL OF BONE AND JOINT SURGERY. *Vol. 41A, Dec. 1959.*

◇ **A Questionnaire Survey of Juvenile to Young Adult Amputees Who Have Had Prostheses Supplied Them Through the University of Illinois Division of Services for Crippled Children. Claude N. Lambert, and Jean Sciora. pp. 1437-1454.**

This study is a summary of the findings from 182 questionnaires received from the parents of juvenile amputees whose ages ranged from nine months to 20 years at the time of the amputation. The children were fitted with the prostheses between 1945 and 1955. Ninety-four amputations were due to trauma and 71 were congenital. The remaining amputations were for malignancies or disease.

Definite conclusions could not be made about surgical treatment. However, in the traumatic group, the greatest number of revisions were done in children with below-knee amputations. This study also indicated that the younger the child, the greater the number of surgical revisions.

Stump care following surgery, such as bandaging to reduce induration and edema, daily cleansing with germicidal soap, avoidance of excessive perspiration and the wearing of clean, soft stump socks, is highly important. All patients should be given these instructions; however, in this study only 75 parents indicated that they had received instructions in stump care, which again stresses the importance of ascertaining that patient and parent understand instructions.

Of 65 upper extremity amputees 26 had complaints of pain, skin irritations, or a poor fitting prosthesis. Only 32 of these patients wore their prosthesis all day. There was a close correlation between the length of time the prosthesis was worn daily with the skill the patient demonstrated with the prosthesis. Of the 22 congenital amputees, only 7 wore their prostheses

all day, and it was apparent that the patients fitted earlier in life were more efficient users of their prostheses and consequently wore them for a longer period of time. All of the lower extremity amputees except one wore their prostheses all day.

The fitting of children with upper extremity amputations with a hand terminal device did not improve their adjustment to the prosthesis.

Training for upper extremity prosthesis wear is vitally important and this study shows that those patients who received adequate training were more likely to use their prosthesis.

◇ **Electromyographic Analysis of the Function of the Muscles Acting on the Ankle During Weight-Bearing with Special Reference to the Triceps Surae. S. J. Houtz, and F. P. Walsh. pp. 1469-1481.**

Muscle action potentials were recorded from the tibialis anterior, extensor digitorum longus, medial and lateral heads of the gastrocnemius and soleus; peroneus longus and brevis and flexor digitorum longus in 10 young adults while recumbent and erect and during locomotion.

During relaxed setting there was electrical silence. In the act of standing bursts of action potentials were limited to the tibialis anterior and extensors of the toes which support the tibia on the tarsus as the subject rises to a standing position. In the majority of electromyograms, continuous action potentials were observed from the soleus, tibialis posterior, peroneus brevis and flexor digitorium longus during standing. There was also periodic bursts from the medial gastrocnemius.

With the knee hyperextended, activity in the gastrocnemius ceased. From this observation it was concluded that the gastrocnemius is concerned with alterations in knee position rather than ankle function.

Relaxed standing on an inclined or declined plane of 20 degrees does not influence the magnitude of the action potentials in the contracting muscles or change the muscles which participate. The body automatically aligns itself to keep the center of gravity over the feet.

During walking, the gastrocnemius and soleus muscles stabilize the knee and ankle in the stance phase while during the swing phase the ankle dorsi flexors act to clear the toes of the ground.

A ten-year analysis of intertrochanteric fractures of the femur. *Cleveland, Mather; David M. Bosworth; Frederick R. Thompson; Hudson J. Wilson, Jr., and Tadao Ishizuka. p. 1399.*

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JOURNAL OF PEDIATRICS. *Vol. 55 (No. 6), Dec. 1959.*

◇ **Neurological and Intellectual Status of Prematures at Three to Five Years of Age. P. A. Harper; L. K. Fischer, and R. V. Rider. pp. 679-690.**

This paper represents the second of a series proposed to follow a group of 500 prematurely-born infants over several years of growth and development, comparing them with a match group of 500 full-term infants of over 5½ pounds birth weight from the same hospital population and socioeconomic groups. The first study which was reported in 1956 covered the findings at 40 weeks of age; the present report carries the findings on examination of these children at three to five years of age. Statistical tables are given comparing the infants by weight groups and by age, showing the neurologic and intellectual status. As at 40 weeks of age, the prematurely born infants showed a trend toward lower intellectual ability and fewer of the infants were judged to be neurologically normal. The trend was most marked in infants whose birth weight was under 1,501 grams and least marked in the group between 2,001 and 2,500 grams. It is important to note, however, that in spite of this trend, the great majority of these prematurely-born infants are within the normal range both neurologically and intellectually.

Myocardial infarction in the perinatal period. *Richart, R., and K. Benirschke. p. 706.*

A new electrocardiographic observation in cretinism. *James, T. N., and C. Y. Bowers. p. 727.*

Seasonal distribution of initial appearance of postnatal ossification centers in hand and wrist of undernourished children. *Dreizen, S.; R. M. Snodgrasse, and T. D. Spies. p. 738.*

Evaluation of growth data. *Stuart, H. C. p. 803.*

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"Pulse of a Nation" . . . . .

portrait of washington, d. c. iii

Mecca for every visitor is the lofty Washington Monument, started in 1848 and completed in 1885. A monument in honor of George Washington was first considered by the Continental Congress in 1783. At the time of his death, and during the next three decades, Congress failed to take definite action on many additional proposals for the erection of a suitable memorial. In 1833, the Washington National Monument Society was organized by influential citizens of the Capital who were determined to make reparation for the failure of Congress. The progress of the Society was at first slow, but by 1847 the sum of $70,000 had been collected by popular subscription. A design by Robert Mills, well known as an architect, was selected but later greatly revised. Congressional authority for the erection of the monument was soon granted and on July 4, 1848, the cornerstone was laid with elaborate Masonic ceremonies. The same trowel used by Washington at the laying of the cornerstone of the Capital in 1793 was employed on this occasion.

The majestic Washington Monument framed by the famous Japanese cherry trees

Work progressed favorably until 1854, when the building of the monument became involved in a political quarrel of the moment, estranging a large body of citizens and discouraging the collection of funds. The unfortunate affair, together with the growing dissension between the North and South, caused the monument to stand incomplete at a height of about 153 feet for almost 25 years. Finally on August 2, 1876, President Grant approved an act enabling the federal government to take over and complete the erection of the monument. The work was resumed in 1880, and the new Maryland marble with which the shaft is faced, was secured from the same vein as the original stone used for the lower portion. It came from a different strata and has weathered to a slightly different tone. This explains the "ring" noticeable on the monolith today. The walls of the memorial reached the height of 500 feet on August 9, 1884, and the capstone was set in place on December 6, 1884, marking completion of the work. Dedicated on February 21, 1885, the monument was opened to the public on October 9, 1888.

The White House

Few visitors to Washington fail to inspect the White House, residence of the men chosen by the people to guide the affairs of the Nation. Now rebuilt to last centuries, the building retains its original simplicity of appearance and its rich historical association. It was first occupied by President and Mrs. John Adams in November 1800. Some of the interior had not then been completed and Mrs. Adams used the unfinished East Room to dry the family wash. During Jefferson's administration, the east and west terraces were constructed. Jefferson practiced democratic simplicity in his social life and it was his custom to open the house each morning to all arrivals. When James Madison became president in 1809, his wife, the famous Dolly Madison, introduced some of the brilliance and glitter of the old world courts into the social life of the White House.

In 1814 the British captured the city and burned the building in retaliation for the destruction of some public buildings in Canada by American troops. Although only the partially damaged sandstone walls and the interior brickwork remained when reconstruction was begun in the spring of 1815, the building was ready for the occupancy of President Monroe in December 1817. The south portico, a dominant feature of that side of the house, was built in 1824 and five years later the large north portico over the entrance and driveway was added.

Throughout its history the building has kept pace with modern improvements. Spring water was piped into the building in 1834 and gas lighting was introduced in 1848. Five years later a hot water heating system was installed. During the Johnson administration the east terrace was entirely removed and in 1882 the first elevator was put in and a decade later, during the term of Benjamin Harrison, the house was first wired for electricity.

Over the years, piecemeal alterations had weakened many of the old wooden beams and interior walls, but not until a thorough examination of the structure was made in 1948 was the really alarming condition of the house revealed. Consequently, a Commission on Renovation of the Executive Mansion was established by an Act of Congress to decide whether to erect an entirely new building or preserve as much as possible of the old structure. They decided the old sandstone walls would be retained, thus preserving the historical appearance of the famous old building.

The renovation was not completed until 1952 and Congress had appropriated nearly six million dollars for the work involved. Today the White House has 132 rooms and 20 baths and showers, compared to 62 rooms and 14 baths prior to the renovation. Formerly there was one elevator and now there are five. In addition to making the building as durable and fireproof as possible, the work was carried out to retain or restore much of the original atmosphere and at the same time provide the President and his family with a more efficient and livable home.

Just as the White House has grown and expanded through the years, so have the other departments of government and the federal city. The Department of Defense is housed in the world's largest office building, the Pentagon, with some 40,000 employees.

Rich as it is in history, the capital city is still the bridge between what is past and what is to come. Always one of the nation's principal news sources, the city is rarely out of the spotlight. Washington today is both big and modern but remains enriched with history and tradition.

Places of Interest

THE MALL AND VICINITY

POST OFFICE DEPARTMENT is at 12th Street and Pennsylvania Avenue, N.W. The Benjamin Franklin post office station is on the ground floor. In Room 1315 there is an international philatelic exhibit which is open from 9:00 a.m. to 5:00 p.m., and a Philatelic Agency where United States commemorative and regular stamps may be purchased at face value. The exhibit and agency are open from 9:00 a.m. to 5:00 p.m., Monday through Friday; Saturday to 4:30 p.m. It is closed on Sunday and holidays.

DEPARTMENT OF LABOR, GOVERNMENT AUDITORIUM and Interstate Commerce Commission occupy three buildings in the Federal Triangle, facing Constitution Avenue, between 12th and 14th Streets, N.W. Prize-winning photographs of American workers, many of them life-size, are on display in the main corridors of the first floor of the Labor Department.

DEPARTMENT OF COMMERCE, between Constitution Avenue, and E Street, 14th to 15th Streets, N.W., covers eight acres. This is one of the largest office buildings in the world. Open 8:30 a.m. to 5 p.m., Monday through Friday.

SMITHSONIAN INSTITUTION is housed in a group of buildings facing the Mall. On Jefferson Drive between 9th and 12th Streets, S.W. is the administrative building for the several bureaus under control of the Institution. In this building are the graphic arts exhibit and an index exhibit depicting the scope of the Institution's work. Open daily, 9:00 a.m. to 4:30 p.m.; no admission fee.

NATURAL HISTORY BUILDING, Constitution Ave. at 10th Street, N.W., contains exhibits of animal habitat groups, birds of the world, American furniture, silver and glass, Indian groups, gems, extinct monsters, geological and other natural history and anthropological exhibits. This building also contains the National Collection of Fine Arts, exhibiting paintings, sculpture and other art objects. Open daily, 9:00 a.m. to 4:30 p.m.; no admission fee.

ARTS AND INDUSTRIES BUILDING, 9th Street and Jefferson Drive, S.W., is on the south side of Smithsonian Park. Exhibits illustrate arts, industries and American history. These include inventions, power machinery, textiles, manufactures automobiles, airplanes and locomotives, as well as medicine and public health exhibits, stamps and coins. It also contains Lindbergh's *Spirit of St. Louis*, Langley's planes, the Wright brothers' *Kitty Hawk* and Wiley Post's *Winnie Mae*; as well as a series of period rooms displaying original gowns worn by Presidents' wives. Open daily, 9:00 a.m. to 4:30 p.m.; no admission fee.

AIRCRAFT BUILDING, Independence Avenue west of the Arts and Industries Building, contains airplanes famous for "firsts" in aviation and exhibits illustrating the development of aeronautics. The fighting planes of both World Wars and the Korean War are included. Open daily, 9:00 a.m. to 4:30 p.m.; no admission fee.

FREER GALLERY OF ART, 12th Street and Jefferson Drive, S. W., contains bronzes, paintings, jade, pottery and sculpture from the Far East, Near East and India; also included is a limited collection of American paintings with emphasis on Whistler including his famous "Peacock Room." Open daily, 9:00 a.m. to 4:30 p.m.; no admission fee.

DEPARTMENT OF AGRICULTURE occupies the Administration and South Agricultural Buildings, extending from 12th to 14th Streets, S.W., between Independence Avenue and Jefferson Drive. Department publications are available in room 104-A of the Administration Building. Murals of Department activities decorate the walls of the main entrance and the Patio of the Administration Building. Exhibits are frequently on display in the Patio. Time educational films are shown continuously in the Patio Theater (Room 114-A) Monday through Friday, 9:15 a.m. to 5:15 p.m.; no admission fee.

WASHINGTON MONUMENT stands at the western end of the Mall. The monument grounds extend from 14th to 17th Street, and from Constitution Avenue to Independence Avenue. In the center of this tract, on a slight elevation, rises the severe marble shaft, 555 feet from the ground to the apex. An elevator runs to the observation room at the 500-foot level, from which there are splendid views of the city and the Virginia hills. Open daily, from 9:00 a.m. to 5:00 p.m. A charge of ten cents is made for elevator service to the top of the shaft; children under 19 are admitted without charge.

BUREAU OF ENGRAVING AND PRINTING is south of the Monument grounds, at 14th and C Streets, S.W. Tours Monday through Friday, except holidays, 8:00 a.m. to 11:00 a.m. and 12:30 p.m. to 2:00 p.m. Here the government designs, engraves and prints paper money, bonds, checks, revenue and postage stamps.

POTOMAC PARK is divided into West and East Potomac Parks. Ohio Drive follows the River, the Washington Channel and the Tidal Basin. This drive, beautiful at all times with trees and flowering plants, is exceptionally lovely in April when the 1,200 Japanese cherry trees are in bloom around the Tidal Basin and East Potomac Park. Facilities for golf, picnicking, swimming, tennis, baseball, horseback riding; boats may be rented. Refreshments, cabins and tent and trailer space also are available.

THOMAS JEFFERSON MEMORIAL is on the southeast side of the Tidal Basin. It is a circular domed structure surrounded by Ionic columns. The central memorial room contains a heroic bronze statue of Jefferson by Rudolph Evans and panels containing inscriptions from the most significant of Jefferson's writings. The monument is open daily, from 9:00 a.m. to 9:00 p.m.; there is no admission charge.

WHITE HOUSE AND VICINITY

WHITE HOUSE, 1600 Pennsylvania Avenue, N.W., was built of gray sandstone on a rough piece of land terminating in the swamps. Since 1792, when construction of James Hoban's design began, the Presidential Mansion, surrounded by beautifully landscaped lawns, has become one of the most outstanding buildings in Washington. The grounds adjoin the Ellipse on the south, which merges with the Washington Monument grounds. Also on the estate is the White House Office Building, conforming in design and color to the White House. The south grounds are open to the public only during the annual Easter egg rolling, but visitors may tour the house Tuesday through Saturday, 10:00 a.m. to 12:00 noon. It is closed on Sunday, Monday and holidays. A portion of the ground and first floor, including the East, Red, Blue, Green and State Dining Rooms, are open. The entrance for tourists is on East Executive Avenue.

U. S. TREASURY, on Pennsylvania Avenue, at 15th Street, N.W., is east of the White House. Exhibit room is open to visitors 9:30 a.m. to 3:45 p.m., Monday through Friday.

THE PRESIDENT'S GUEST HOUSE (Blair House), 1651 Pennsylvania Avenue, N.W., is noteworthy for its association with many great Americans, including Abraham Lincoln, Andrew Jackson, Martin Van Buren, Robert E. Lee and Jefferson Davis. It was here that Robert E. Lee, at Lincoln's insistance, was offered the command of the Union Army. The house, is used by the President as a guesthouse for distinguished visitors.

LAFAYETTE SQUARE, across Pennsylvania Avenue from the White House, contains many rare trees. The equestrian statue of Andrew Jackson by Clark Mills is the central monument.

ST. JOHN'S CHURCH (Episcopal), 16th and H Streets, opposite Lafayette Square, is known as the "Presidents' Church" because Presidents Madison, Monroe, John Quincy Adams, Jackson, Van Buren, Harrison, Tyler, Fillmore, Buchanan, Arthur, Franklin D. Roosevelt, Truman and Eisenhower have attended services there. Many of the stained-glass windows are dedicated to famous statesmen. The building is open daily 7 a.m. to 7 p.m.

CHRISTIAN SCIENCE WORLD ACTIVITIES ON DISPLAY, in the Christian Science Building, 1601 Eye Street, N.W., traces the origin, scope and healing ministry of Christian Science in miniature, model—picture and sound. Open daily 10:00 a.m. to 6:00 p.m., on Sunday from 2:00 p.m. to 6:00 p.m.; no admission charge.

NATIONAL HOUSING CENTER, 1625 L Street, N.W., is headquarters for the National Association of Home Builders and a permanent exhibit center. It contains five floors of designs, building technics, equipment and materials that go into the modern home. The exhibits are changed frequently to keep pace with new developments in the housing industry; representatives of NAHB explain the displays. Open Monday through Saturday, 10:00 a.m. to 6:00 p.m., on Sunday from 1:00 p.m. to 6:00 p.m.; no admission charge.

TRUXTUN-DECATUR NAVAL MUSEUM, 1610 H Street, N.W., contains scale models of some famous naval craft and murals of historic sea battles. Open Tuesday through Friday, 12:00 noon to 5:00 p.m., on Saturday from 10:30 a.m. to 5:00 p.m., on Sunday from 12:00 noon to 5:00 p.m.; no admission charge.

book reviews

PROGRESSIVE EXERCISE THERAPY IN REHABILITATION AND PHYSICAL EDUCATION. By *John H. C. Colson*, F.C.S.P. Cloth. Price, $4.50. Pp. 184, with illustrations. The Williams & Wilkins Co., Mount Royal and Guilford Aves., Baltimore 2, 1958.

The prerequisite of all exercise programs for the increase of muscle power, is progression. In DeLorme's regime this is evaluated by determining the ten repetition maximum of a muscle and increasing the load proportionately. In more general exercises where weights cannot be used as a measure, there has always been a need to know the order in which different exercises should be prescribed. This book fits this need.

The first part is devoted to progressive exercises at various joints. Each group of exercises is divided into a section on strengthening, and one on mobilizing. The strengthening section is subdivided into Elementary, Intermediate and Advanced; there is a progression of exercises within each subsection. Some pen drawings help to illustrate the exercises.

The second part of the book is on Specific Exercise Therapy, and is mainly related to postoperative exercises, e.g., following Gastrectomy, Appendicectomy, Meniscectomy, etc. There again, the importance of progression is emphasized. The last part of the book is on general exercise therapy, and related to the use of exercises to music and circuit training.

This work will serve as a useful manual and reference book for physical therapists, remedial gymnasts, physical training instructors, or any person interested in prescribing individual or group exercises in an orderly progression of increasing resistance. *(M. T. F. Carpendale, M.D.)*

ADAPTED PHYSICAL EDUCATION IN SCHOOLS. By *Ivalclare S. Howland*, Ed. D. Paper. Price, $3.00. Pp. 174. Wm. C. Brown Company, 135 S. Locust, Dubuque, Iowa, 1959.

This is a textbook which specifically deals with each phase of physical education activities and their adaptation for children with various gradations of physical restrictions. The author states in the introduction that it is a textbook to be used in teaching adapted physical education, where anatomy, physiology, kinesiology, physiology of exercise, health education and general teaching methods are prerequisites. These prerequisites are demonstrably necessary, as one notes the laboratory problems placed at the end of almost every chapter. A bibliography is furnished at the end of each chapter. Many of these references are on the postgraduate level; several are well established texts written by physicians whose particular interest is in physical medicine and rehabilitation. This then, is one of the most complete bibliographies in this field that has been assembled in many years.

Foundations of program planning, determinations of needs, recognition of orthopedic deviations and faulty mechanics, and a detailed orthopedic-body mechanics test, classifications and assignment of each child provide the basic discussion, but at no point in these matters is the teacher made to feel that he is making medical decisions or judgments in any instance. The place of the physician, the teacher, the parents and the individual child are clearly delineated. Practical adaptation in all types of sports is discussed. Scheduling and specific individual progress for special classes are detailed, as are recreational activities in the special class. *(Nila Kirkpatrick Covalt, M.D.)*

ORTHOPAEDIC SURGERY. By *Sir Walter Mercer*, F.R.C.S. Fifth edition. Cloth. Price, $12.00. Pp. 1075, with illustrations. The Williams & Wilkins Company, Mount Royal & Guilford Aves., Baltimore 2, 1959.

Sir Walter Mercer is Professor Emeritus of Orthopedic Surgery at the University of Edinburgh and Chairman of the British Editorial Board of the *Journal of Bone and Joint Surgery*. This comprehensive textbook of orthopedic surgery is an outgrowth of his many years of teaching. The fifth edition is not greatly changed from the fourth edition published in 1950. Although its value in a section of physical medicine and rehabilitation would be limited, it will serve as a study guide and reference work for medical students, residents training in orthopedic surgery, and those in surgical practice. Many of the sections, however, are predominantly basic in their orientation and lack the detailed material required by the resident or fellow in orthopedic surgery.

The book is divided into 22 chapters. In reviewing these, one finds that a number of the sections are outstanding, whereas others appear sketchy and leave a good deal to be desired. The section on tuberculosis of bones and joints is more than 100 pages long, and is probably the best part of the book. The chapters on arthritis and on problems of the foot and ankle are well organized and informative. The section on bone tumors does not include the recent findings and classifications that are becoming standard among American orthopedic surgeons and pathologists. The physician interested in physical medicine and rehabilitation will find the sections on cerebral palsy, arthroplasties, and poliomyelitis disappointing. Little reference is made to physical treatment of these conditions. The chapter on scoliosis is good and the role of therapeutic exercise is logically evaluated.

The style of writing makes the book very readable, and organization within the various chapters is satisfactory. The illustrations, particularly the reproductions or roentgenograms, are not outstanding. However, many of the diagrammatic drawings are excellent. The bibliography at the back of the book is not extensive. It includes some recognized works, but many significant articles are not mentioned. *(Gordon M. Martin, M.D.)*

RECREATION IN TOTAL REHABILITATION. By *Josephine L. Rathbone,* Ph. D., and *Carol Lucas,* Ed.D. Cloth. Price, $9.50. Pp. 398. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1959.

The role of recreation in the rehabilitation of the seriously and chronically disabled individual is one of some importance to physicians in charge of these patients and, in most instances, hospital superintendents. Very often, economic pressures have to be met and the medical values of recreation should be judged by the physician responsible for these patients. This book is written by experienced professionals in this aspect of rehabilitation and is worthy of study both by hospital administrators and interested physicians. The thesis that rehabilitation is important for such chronically disabled patients is perhaps generally accepted, but at times considered as a luxury. This book very well presents the proposition that the most effective recreational therapy should be in the hands of those who are well acquainted with the pathological aspects of the physical and mental disabilities of the patients they are treating. It also indicates that this type of service is fundamentally a professional service, requiring a special sort of training; in other words, this type of treatment is not readily provided by volunteers without training. The reasons for this are well brought out by the text which indicates, in detail, how a background of physical and psychological pathology is important for people working in this field. Details of therapeutic care in this field are well described in the various chapters devoted to acute and chronic disabilities as well as the different types of disease processes. There is also a good discussion of the various media available for use by the therapists.

This is an important reference book for therapists of any category interested in the care of handicapped patients and for administrators in determining the individual needs of the patients other than medical care. The book is comprehensive and well written and worthy of serious consideration by all concerned with rehabilitation. It is yet to be determined whether there is a necessity for a separate group of professionals in the field of recreation or whether this need can best be filled by those who have a fundamental background in either physical or occupational therapy. *(Arthur L. Watkins, M.D.)*

THE FOOT AND ANKLE: Their Injuries, Diseases, Deformities and Disabilities. By *Philip Lewin,* M.D. Cloth. Price, $14.00. Pp. 612, with 339 illustrations. Lea & Febiger, Washington Sq., Philadelphia 6, 1959.

This well-known medical text in its fourth edition attests to its popularity and usefulness. In general the outline and chapter headings are unchanged from the previous edition but the appendix has many additions. Most of these additions pertain to deformity or surgery of the foot and could have been incorporated into appropriate chapters.

For the reader interested in physical medicine and rehabilitation, the publisher's description arouses interest by the statement, "Among the many features are important techniques, substitutions, transpositions, and rehabilitative procedures . . . ". However, this last item brings disappointment on close inspection because none of present day concepts of rehabilitation are included. In fact, nonoperative treatment in many sections such as poliomyelitis and cerebral palsy has been shortened from previous editions to allow for addition of newer surgical procedures such as the Grice bone block stabilization of the foot. Little or no attention is given in most sections to the postoperative period.

In the section on arthritis of the foot and ankle, physical therapy receives mention by a simple listing of not only the usual features: "thermotherapy, massage, hydrotherapy, contrast baths, hot paraffin dips, passive exercises, active exercises, diathermy, and posture work," but also includes "mechanotherapy, manipulation, passive congestion, mineral baths, mud baths, inductotherm, auto-condensation and negative galvanism, colon therapy, and heliotherapy." The discussion of hemarthrosis in hemophilia remains unchanged from the previous edition and thus fails to mention the control of bleeding by rapidly administered intravenous plasma or transfusions of fresh

whole blood. The section covering gouty arthritis has been brought up to date and includes medical treatment with urocosuric agents such as Benemid.

Manual resistive exercises for strengthening foot and ankle groups in the treatment of flat feet which appeared in the third edition has been omitted in this present one. Under the heading of electrodiagnosis of neuromuscular disorders one brief paragraph mentions faradic and galvanic current and then refers the reader to the appendix for discussion of electromyography. However, a search of the appendix revealed no mention of electromyography.

Thus it appears this comprehensive text on a particular anatomical region is oriented almost entirely to the viewpoint of surgery but in that aspect is an excellent up-to-date reference. *(Thomas P. Anderson, M.D.)*

SYMPOSIUM ON PULMONARY VENTILATION. Papers and Discussion. Edited by Dr. *R. P. Harbord* and Prof. *R. Woolmer*. Cloth. Price, 12 s., 6 d. net. Pp. 109, with illustrations. John Sherratt & Son, The St. Ann's Press, Park Rd., Eltrincham, Cheshire, England.

This small volume is a verbatim transcript of a discussion of several of the problems of pulmonary ventilation — in the newborn, in pulmonary emphysema with carbondioxide narcosis, in airway obstruction. The contributors are predominantly British anesthetists dealing with practical applications of physiologic principles and methods. Although they are working in areas of practical application, it is apparent that they are helping to clarify fundamental principles. The discussion of aeration of the newborn infant's lungs is especially informative for the general reader. One or two chapters dealing almost wholly with instrumentation and measurement have interest principally for the detailed worker in pulmonary physiology.

The volume has the virtues and disadvantages of a verbatim transcript. The speakers, obviously well acquainted with each other's work, sometimes plunge into discussions without clear introduction of their material to the more casual reader. The chapter bibliographies are unfortunately too scanty to lead the casual reader clearly on to the path of the discussion. The informal nature of the discussion lends a virtue of freshness to the text for the informed reader. *(R. C. D., M.D.)*

HYPERTENSION. The First Hahnemann Symposium on Hypertensive Disease. Edited by *John H. Moyer*, M.D. Cloth. Price, $14.00. Pp. 790, with illustrations. W. B. Saunders Company, W. Washington Sq., Philadelphia 5, 1959.

This symposium adequately covers the general field of hypertensive disease, and the newer concepts have been incorporated well into the text. It will serve as an excellent reference book both for the clinician and the research physician. Like all such reviews, some articles are extremely short and by necessity do not cover the subject completely.

Parts I and II are mainly concerned with the basic fundamentals and etiology of hypertension and should appeal to the person interested in research. Despite this the clinician can profit from a careful review of these sections for a more complete understanding of the basic concepts of the disease. However, the one short article dealing with pyelonephritis does not seem adequate for this important aspect of hypertensive disease, whether or not it is a primary or a secondary factor.

The following sections deal with the treatment of hypertension. Incorporated well are the pharmacological studies that aid in the understanding of etiologic factors. The excellent reviews of the pharmacological actions of specific antihypertensive drugs and their clinical applications are worthy of review by every clinician. Important surgical advancements in the treatment of hypertension are covered and offer exciting and new approaches to the disease.

The final summary contains many important and practical considerations in the treatment program of hypertensive patients. Unfortunately only by careful reading of this verbose section can the facts be obtained. Undoubtedly one or two well organized papers would have made this section of much greater value for the busy practitioner. The discussion periods must have been edited, but at times they are prolonged and redundant. The inclusion of directed questions with a "yes" or "no" answer without supplementation adds nothing to the problems involved and could have been omitted.

Of the many things man can do or make here below, by far the most momentous, wonderful and worthy are the things called Books.

— THOMAS CARLYLE

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Congress of Physical Medicine and Rehabilitation and/or the American Academy of Physical Medicine and Rehabilitation.

Deaths

DR. J. ROBLEY ALMER

J. Robley Almer, New York City, died in Beth Israel Hospital on October 31, 1959. Dr. Almer was born in New York City on May 15, 1893. He was graduated from New York Medical College in 1917 and was licensed to practice medicine in the State of New York in 1920. The cause of his death is not known.

DR. H. BRUNO ARNOLD

H. Bruno Arnold died at his home in Woodbridge, Conn. on January 8, 1960 after being involved the past eighteen months with a massive coronary. Dr. Arnold was born in 1902 and was graduated from Yale Medical School in 1927. Dr. Arnold was the son of the late Dr. Ernst H. Arnold, founder of Arnold College in Milford, now part of the University of Bridgeport. He was president of the college for four years before World War II. During the war Dr. Arnold was a Navy captain assigned to the Brooklyn Naval Hospital. He had been director of the Department of Physiatrics at the Hospital of St. Raphael in New Haven since 1946.

DR. ANTHONY BASSLER

Anthony Bassler of New York City passed away on August 29, 1959 at the age of 85. He was born in New York City on May 24, 1874 and was graduated from Bellevue Hospital Medical College in 1898. He was successively a lecturer in pediatrics, pathology, and internal medicine at his alma mater from 1900 to 1910. For many years he served on the faculty at New York Polyclinic Medical School and Hospital and Fordham University School of Medicine. A specialist certified by the American Board of Internal Medicine, Dr. Bassler was affiliated with a great many various gastroenterological associations, as well as the founder of the Section on Gastroenterology of the American Medical Association.

DR. WILMOT L. MARDEN

Wilmot L. Marden, Lincolnville, Me., died in the Camden (Maine) Community Hospital on August 1, 1957 at the age of 81 of carcinoma of the prostate. He received his medical degree at Boston University School of Medicine in 1898 and formerly practiced in Lynn, Mass. where he was on the staff of the Union Hospital.

DR. MADGE C. L. McGUINNESS

Madge C. L. McGuinness of New York City passed away on December 9, 1959. She was born in New York City on January 8, 1884 and was graduated from the Women's Medical College of Philadelphia in 1908. Dr. McGuinness was formerly director, and at her death, a consultant in physical medicine and rehabilitation at Misericordia and Lenox Hill Hospitals. Long active in advancing the status of women in medicine, she won the 1952 award of the Women's Medical Society of New York, of which she was a former president. Dr. McGuinness had lectured at New York University and the College of Physicians and Surgeons of Columbia University. She had served also as chief of clinic at Vanderbilt Clinic of the Columbia-Presbyterian Medical Center.

DR. ISIDORE I. NEISTADT

Isidore I. Neistadt, Hewett, N. Y., passed away on November 28, 1959 in South Nassau Communities Hospital, Oceanside, after a heart attack. Dr. Neistadt was born on November 21, 1905 in Baltimore, Md. He received his medical degree from the University of Maryland, Baltimore, in 1929. Dr. Neistadt was a consultant in the rehabilitation program for convalescing patients at Meadowbrook Hospital and a member of the staff at South Nassau Communities Hospital and St. Joseph's Hospital, Far Rockaway.

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